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TREATISE

ON THE

INFLUENCE OF CLIMATE

ON THE

HUMAN SPECIES, &c.

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QON

TREATISE

ON THE

INFLUENCE OF CLIMATE

ON THE

HUMAN SPECIES;

AND ON THE

VARIETIES OF MEN RESULTING FROM IT;

INCLUDING AN ACCOUNT OF THE CRITERIA OF INTELLIGENCE WHICH THE FORM OF THE HEAD PRESENTS; AND A SKETCH OF A RATIONAL SYSTEM OF PHYSIOGNOMY AS FOUNDED ON PHYSIOLOGY.

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The Author avails himself of this advertisement, to acknowledge his obligations to those authors from whose works he has benefited in the composition of this Treatise.

In the FIRST PART, *he is chiefly indebted to the "Essay on the Causes of the Variety of Complexion and Figure in the Human Species" by* DR SMITH OF PHILADELPHIA.

In the SECOND PART, *he is under great obligations to "The Works" of* PROFESSOR CAMPER OF FRANIKER, *and the Treatise "De Generis Humani Varietate Nativa" of* PROFESSOR BLUMENBACH OF GÖTTINGEN.

In the THIRD PART, *the Physiologist alluded to, is* MR WALKER, LECTURER ON ANATOMY AND PHYSIOLOGY, AT EDINBURGH.

In the FOURTH PART, *his obligations are to the Lectures of* THE SAME PHYSIOLOGIST.

In the FIFTH PART, *the Application of the preceding principles to the Passions, as expressed by Camper and Le Brun, is more especially his own.*

Throughout, he has adopted that arrangement which seems to him most systematic and impressive; and he has introduced whatever observations appeared to him to render the subject more complete.

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PREFACE.

PREVIOUS to examining the Influence of Climate and other external agents on the form and colour of man, it cannot be improper briefly to investigate that capacity of matter, by which it is enabled to pass through every form and every colour.

The simple fact, that the same objects appear in the same place to any one, proves that there exists something independent of sensation—a cause or at least a basis for all sensation. This cause or basis of our sensations, is denominated

MATTER; and the first two axioms of philosophy, express the fundamental truths which refer to it: 'Nothing,' say they, 'has no property'; and 'no substance, or nothing can be produced from nothing.' These axioms, blended indeed with the errors of heathen philosophy, are admirably expressed by Lucretius, in the following lines;

> Know this grand truth, the base of nature's law,
> NOUGHT CAN THE GODS THEMSELVES FROM NOTHING DRAW.
> When lurid meteors fire the troubled air,
> When thunders below, and blue lightnings glare,
> Fear-struck, and strangers to the grand design,
> Weak men ascribe them to a power divine:
> But this great truth illumes the erring mind,
> Her gloomiest terrors scatters to the wind,
> And shews, how heaven and earth are spread abroad,
> Uncalled, unaided by the power of God.

Such being the fundamental truths which refer to matter, we are naturally led to the consideration of space.

SPACE is either the absence of matter, or the distance between its portions or between objects; and, without this, no motion could take place, nor

any external operation exist—a truth which Lucretius, with equal felicity, expresses in the following lines:

But think not matter crowds her whole domain,
An incorporeal void her realms contain;
A splendid truth, to guide the erring soul,
Dispel thy doubts, and ope the mighty whole!
A void is vacant space which touch defies,
And in this void the source of motion lies.
For were it not—as bodies are possest
Of power inert, for ever must they rest,
And each to each a fixed resistance prove;
Then whence were motion, if no space to move?
If doomed no impulse ever to obey,
Fixed were the whole, and wedged in close array
But, lo! the heavens revolve around the pole,
Earth, air and seas, in various movements roll.
But had not nature formed a wide inane,
Silent and sad had stretched her dull domain;
No life had bloomed, no creature raised its head,
But crowded matter lain unformed and dead.

Such space between the parts of matter, leads us naturally to the consideration of the particles which the interposition of space thus forms.

With the PARTICLES, or simplest state, of matter, then, it is highly probable, that the simplest form—perfect sphericity, is connected.

Considering matter, therefore, as one and the same—as constituting a class, there must exist of it at least two subordinate orders, viz. that consisting of particles of some magnitude or Spheres, and that consisting of particles of extreme minuteness, and which are still spherical, but which, relatively to the former, may be termed Points.—Two such orders must exist, because, on one hand, without some difference, individual bodies could not be characterized; and, on the other, it is unphilosophical to suppose more than two such orders, because from these, every distinction in nature may arise.

For, supposing these two states of matter to constitute oxygen and hydrogen, such a distinction as that I have pointed out, will account for their most remarkable qualities, and the most remarkable of the phenomena which result from them.

Thus, as equal bulks of these two fluids have different weights, exactly so will equal bulks of larger and smaller spherical particles; for, as a large sphere contains more matter within a given portion of superficies than a small one, the bulk

of smaller particles will contain a greater portion of superficies, and consequently more of vacuum between the particles, than an equal bulk of larger ones; and that bulk which contains most of vacuum and least of solid matter, must obviously be lightest. Thus, a given bulk of smaller spheres, is lighter than an equal bulk of greater ones. Nor is it to hydrogen and oxygen alone, that this reason is applicable: all lighter bodies of the simplest kind, must consist of minuter particles; for that levity which arises from a peculiar arrangement of these particles, can exist only in the more complex substances.

But it is not alone with regard to levity, that minuter particles evidence the same phenomena with hydrogen, and larger ones the same with oxygen. Hydrogen is susceptible of inflammation. This certainly consists in motion of the minute particles of matter. Now, the minuter the particles, the more susceptible are they of motion, and, therefore, of inflammation; and, hence hydrogen, consisting of the minutest particles, is most susceptible of inflammation.

Considering, then, this minuteness and magnitude as affording the orders of character in matter, it must now be obvious that the various arrangement of these particles must produce the genera and species.

Numerous phenomena also lead to the conclusion, that the degrees of the separation of the particles of matter constitute the states of solidity, liquidity and fluidity.

The capabilities of matter are thus truly wonderful; and, on these very simple principles, their whole extent is easily foreseen. Thus, the different magnitude of its elementary particles, gives origin to two *simple substances*—oxygen and hydrogen for instance; their various arrangements and various combinations produce the more complex bodies; and the actual contact, or the degree of the separation, of the particles causes, either in simple or complex bodies, the states of *solidity, liquidity and fluidity.* If the particles be in actual contact, they will move together and form a solid; if slightly separate, they will glide on each other and form a liquid; and if altogether

detached, they will become buoyant and constitute an aeriform fluid.

That all this is accurately the case, I do not pretend. But the reasonings here entered into, point out at least the very simple means by which nature may have operated the vast variety of things.

Minute as these elements of matter are, their existence has been rendered obvious to the most common observer by this admirable passage of Lucretius.

Since thus the Muse has sung, in arduous strain,
Nought springs from nought, nor sinks to nought again,
Lest thou, distrustful, deem the strain untrue,
Because primordial seeds elude the view,
Hear the clear proof, and then with me unite
To own that seeds exist, yet shun the sight.
Mark how the whirlwind, with resistless sweep,
Drives the black clouds, and rolls the foamy deep,
Thro' shattered fleets and prostrate forests roars,
And shakes the mountains and the cavernèd shores.
Unseen, yet felt, thus many a viewless form
Rides in the air, and swells the rapid storm.
That scours heaven, earth, and seas, and far and near
Carries fell havoc in its dread career.
Onward it rolls impetuous as the flow
Of furious torrents swoln with melting snow,

Or spouting cataracts of sudden rain,
Down the steep mountains foaming to the plain:
Thro' cliffs and valleys roars th' increasing flood,
Tears the close shrubs, uproots the stubborn wood,
Rolls ponderous rocks with unresisted sway,
Bursts the strong arches, sweeps the bridge away
With thundering crash, and o'er each yielding mound
Spreads a wide, deep and savage waste around.
Thus wild thro' heaven the whirlwind roars along
Its way so rapid, and its rage so strong;
Where'er it turns its blind infuriate course,
It sweeps the world with swift unbridled force,
Trees, rocks and hills uptears, and bids them fly
In many a whirling vortex thro' the sky.

A more accurate notion, in the next place, of the CAPABILITIES of matter—of its power to assume every form and every colour; cannot be formed than by explaining, according to my apprehension of it, a splendid and philosophical allegory of the religion of the Greeks.

Under the epithet of Proteus, the God of Change, this religion personified the πρῶτη ὕλη—the *original matter*, capable of every form; and supposed, that his daughter Eidothea, the Goddess of Formation (an epithet derived from εἴδεος θεὰ, or according to Eustathius, from εἰς εἶδος θέειν, to rush into form) upon occasion, went in search of

and discovered him; indicating thereby, that, as Proteus was discovered by his daughter Eidothea, so original or simple matter—the πρῶτη ὕλη was discovered to our senses by εἶδος, *form*—its offspring, its quality.

Ammonius, though by no means more than the moderns aware of its principle, beautifully illustrates this allegory, when he says, "Matter, with regard to things, is the cause of their common nature; form, of their peculiar difference. All change, then, of beings into each other, is by means of their participating the same common matter;" and (he might have added) every distinction depends upon individual form.

From all this train of reasoning, and from this mythological allegory of the Greeks in particular, we clearly see how mineral matter may pass into vegetable, vegetable into animal, and animal into mineral again; in perfect consistence with the fact, that vegetables are nourished by mineral matter, and many animals entirely by vegetables, while all animals return to mineral substance again. The action of the air and rains, as well as storms and tempests, gradually wear away the

summits and the sides of the mountains; their earthy and metallic particles are swept into the plains by the torrents and the winds; and, the heavier portions falling undermost, the lighter resting above, banks luxuriant in vegetation, like those of the Nile or the Ganges, are formed, and a rich mould is driven over the plains. Hence, springs grass and shrubs and trees, and all the fruits of the earth. These again afford food to every animal tribe; and animals, when the period of life is expired, fall into the dust whence originally they arose. Even the analyses of science present to us the calcareous, ferruginous and other mineral matters which actually exist in the solids and fluids of animated beings. Thus, matter passes through an endless circle and endless succession, of which a portion is thus exquisitely painted by the great Epicurean poet.

When father Æther pours his stores from high,
Absorbed by earth, they seem to fade and die;
But, lo! how soon their genial power is seen,
Springs the dense grass, and earth is clothed in green;
The leafy verdure of the forest shoots,
And ripening orchards hang their glossy fruits;
Hence men and brutes arise in vigour strong,

Hence blooming youths the joyous city throng,
And groves repeat the feathered warbler's song;
Hence battening herds enjoy their grassy food,
And their full udders pour the milky flood.
With rapture filled, their progeny around
Try their weak limbs in many a frólic bound,
And as the dulcet stream distends their veins,
In life's gay morning gambol o'er the plains.
Thus nature bids th' immortal seeds revive,
Life springs from death, and new creations thrive.

Since, then, such are the changes of bodies into each other—of mineral into vegetable, vegetable into animal, and animal into mineral again, it can scarcely be wondered that the same external powers which operate these vast effects, should also produce those comparatively trivial changes on animal bodies in particular, which, in the following Treatise, are with so much reason ascribed to climate &c.

" *Il est certain que le* sol *et l'*atmosphère *signalent* leur empire *sur toutes les productions de la nature, à commencer par l'*homme, *et à finir par les* champignons."

VOLTAIRE.

—— " In varias leges, variasque figuras
Dispositum genus est hominum, proprioque colore
Formantur gentes, sociataque jura per artus
Materiamque parem privato fœdere signant.
Flava per ingentes surgit GERMANIA partus.
GALLIA vicino nimis est infecta rubore.
Asperior solidos HISPANIA contrahit artus.
MARTIA ROMANIS orbis pater induit ora:
GRADIVUMque suum miscens bene temperat artus.
Perque coloratas subtilis GRÆCIA gentes
Gymnasium præfert vultu, fortesque palæstras:
Et SYRIAM produnt torti per tempora crines.
AETHIOPES maculant orbem, terrasque figurant.
Perfusas hominum gentes minùs INDIA tostas
Progenerat, mediumque facit moderata tenorem.
Jam proprior tellusque natans AEGYPTIA NILO
Leniùs irriguis infuscat corpora campis.
POENUS arenosis AFRORUM pulvere terris
Exsiccat populos, et MAURITANIA nomen
Oris habet, titulumque suo fert ipsa colore."

MANILIUS, LIB. IV.

TREATISE

ON THE

INFLUENCE OF CLIMATE

ON THE

HUMAN SPECIES, &c.

PART FIRST:

ON THE INFLUENCE OF CLIMATE IN GENERAL.

MANY analogical arguments in proof of the influence of climate in general, might be derived from the well known changes which it produces in inferior animals. Blumenbach, accordingly, after employing the first section of his excellent work "De generis humani varietate nativa," on an account of the difference between man and animals, devotes the second to the discussion of the causes and manners, by which the various species of animals in general degenerate. As, however, the arguments and illustrations on this subject, from the history of man himself, are sufficiently numerous and convincing, to them we shall directly proceed.

Every permanent and characteristic variety in human nature, is effected by slow and almost imperceptible gradations. Great and sudden changes seem too violent for the delicate constitution of man; and, in reality, instead of mere-

ly altering, they always tend to destroy the system. But changes, the effects of which blend with the general actions of the body, and ultimately form the character of a climate or a nation, are progressively carried on through several generations, till the causes that produce them have attained their utmost operation, by becoming perfectly congenial to the system.

In this way, the minutest causes, acting constantly, and during a long period of time, will necessarily create great and conspicuous differences among mankind.

In tracing the globe from the pole to the equator, we observe a gradation in the complexion of man, nearly in proportion to the latitude of the country he inhabits. Immediately below the arctic circle, a high and sanguine colour prevails. From this, we descend to the red, blended with white; and thence, towards the line, succeed, the brown, the olive, the tawny, and, at length, the black.

These gradations are sometimes more, and sometimes less sudden. The women of the province of Biscay, for instance, are very fair; those of Granada, on the contrary, subfuscous, "so that," says Ol. Toree, "in this more southern province, the pictures of the Virgin are painted of the same provincial colour."

The same distance from the sun, however, does not, in every region, indicate the same temperature of climate. Some secondary causes, correcting and limiting its influence, must be taken into consideration. The elevation of the land, its vicinity to the sea, or to great lakes and rivers, the nature of the soil, the state of cultivation, the course of periodical winds, and many other circumstances, enter into this view.

Elevated and mountainous countries are cool in proportion to their altitude above the level of the sea: vicinity to the ocean produces opposite effects in polar and equatorial latitudes; for the ocean, being of a more equal temperature

than the land, in one case, corrects the cold; in the other, moderates the heat*. Ranges of mountains, such as the Appennines in Italy, and Taurus, Caucasus and Imaus, in Asia, by interrupting the course of cold winds, render the protected countries below them warmer, and the countries above them colder, than is equivalent to the proportional difference of latitude.

Climate also receives some difference from the nature of the soil, and some from the degree of cultivation. Sand is susceptible of greater heat than clay; and an uncultivated region, shaded with forests, and covered with undrained marshes, is more frigid in polar, and more temperate in equatorial latitudes, than a country lying open to the direct and constant action of the sun.

Many other circumstances might be enumerated, which modify the influence of climate on the form and colour of man. These, however, will be sufficient to give a general idea of the subject; and, by the intelligent, they may be easily extended and applied to the state of each particular country.

Thus, even from such general observations, we derive this conclusion—that there is a general ratio of heat and cold, which chiefly forms what we call climate, and a consequent general resemblance of nations, according to the latitude from the equator; subject, however, to innumerable varieties from the infinite combinations of the circumstances suggested.

We see, indeed, that one and the same national countenance, is so common to the inhabitants of particular climates, that it is scarcely possible to refer it to any other cause.

Of this, the Chinese are an example, to whom the characteristic flattened face is as common as, among us Euro-

* It is to this cause that the equal temperature and great salubrity of Madeira, for instance, is chiefly owing.

peans, symmetrical and exquisite beauty is (as observed by Blumenbach) to the English and the Majorcans.

It is contrary, therefore, to sound philosophy, which, without necessity, never assigns different causes for similar events, to have recourse, for explaining these varieties, to the hypothesis of several original species; and an attachment to such a doctrine, simply because it opposes a tenet of religion, is unphilosophical in the extreme.

If (I may further observe) we have reason, from the varieties that exist in the same family, or in the same nation, to conclude that the Danes, the French, the Turks and people even more remote, are of the same species; have we not the same reason to conclude, that nations beyond them, and who, if carefully examined, absolutely do not differ from the last by more conspicuous distinctions, than the last differ from the first, are also of the same species? The Arab in particular may with the utmost facility be traced through the Abyssinian into the real African with flattened nose and projecting jaws. By pursuing this progression, we shall find but one species from the equator to the pole.

But, to lay aside general reasoning, universal experience verifies the power of climate, soil &c. on the form and colour of animals.

With regard to man in particular, the summer darkens his skin, and the cold of winter excites a sanguine colour. Even the Æthiop is white at birth, and becomes not black till exposed to the light.

Now, when heat, or cold predominates in any region, it impresses, in the same proportion, a permanent and characteristic colour.

A cold and piercing climate permanently chafes the countenance, and exalts the complexion. A climate that is warm and misty, relaxes the constitution, and gives some tendency, in valetudinarians especially, to a bilious hue.

The sanguine countenance is, for this reason, perpetual

in the highest latitudes of the temperate zone; and we ever find the swarthy, the olive, the tawny and the black, as we descend to the south.

Nor does the colour of these people differ more than their features, as is evident in the European and Æthiop; or their stature, as appears from the Patagonian and Laplander.

This is confirmed by every philosophical research. 'Mankind are for ever changing their habitations by conquest or by commerce; and we find them, in all climates, not only able to endure the change, but so assimilated by time, that we cannot say, with certainty, whose ancestor was the native of the climate, and whose the intruding foreigner.

It is well known what a length of time is required to efface the freckles contracted in a fair skin by the exposure of a single day. These are known to be created by the sun; and they become indelible by time. Now, the sun has power equally to change every part of the skin, when equally exposed to its action. And it is, not improperly, observed by some writers, that the dark colour of many nations may be justly considered an universal freckle.

No individual example of the influence of climate can carry with it greater force than that of the Jews. Descended from one stock, prohibited, by their most sacred institutions, from intermarrying with other nations, and yet dispersed into every country on the globe, this one people is marked with the colour of all—fair in Britain and Germany, brown in France and in Turkey, swarthy in Portugal and in Spain, olive in Syria and in Chaldea, tawny or copper coloured in Arabia and in Egypt.

That the Jews are still distinguishable from Europeans, is doubtless imputable to this, that a still greater length of time is necessary totally to change them. For it cannot be doubted, that the same cause, which has already so greatly altered them, will continue to operate.

A still more striking modern example of the influence of climate, and that of the most indisputable kind, may be already seen in the inhabitants of the United States of America. A certain countenance of paleness and of softness strikes a traveller from Britain, the moment he arrives upon that shore. A degree of sallowness is visible to him, which, through familiarity, or the want of general standard of comparison, hardly attracts the observation of the Americans themselves. This effect is more obvious in the southern, than in the northern states; and more in the lower and labouring classes of people, than in families of easy fortune, who possess the means and the inclination to protect their complexion. That these circumstances present an approach to the Indian cannot be denied. Nor is the fact that the domestic slaves of America are darker than the field ones in opposition to the preceding reasoning. Excessive labour, fatigue and debility may temporarily appear to counteract the influence of the climate, but it is by producing, not a healthy whiteness, but a morbid paleness.

Creols also from English parents, or ancestors in the Antilles, (and who are not to be confounded with mulatoes) change, in some measure, their native British countenance for the indigenous characteristic of the natives of America, and acquire their deep seated eyes, and elevated check-bones, or, as Blumenbach terms it, the 'austrum quasi spirans vultus et color.' So remarkable is the change, that Creole women, otherwise fair and beautiful, may easily be distinguished by that peculiar characteristic, even from their relations of the same sex born in Europe. This is also true of Asiatics born in the West Indies, from Persian and Mongolic parents. If, says Hawkesworth *, two natives of England marry in their own country, and afterwards remove to our settlements in the West Indies, the children that are conceived and born there, will have the complexion and cast of

* Hawkesworth's Collections of Voyages, V. 3. p. 374.

countenance that distinguish the Creole; and if they return, the children conceived and born afterwards, will have no such characteristics.

The colour of the natives of the West India islands, is well known to approach very near a dark copper.—The descendants of the Spaniards, in South America, have already assumed that colour.

The Portuguese of Mitomba, in Sierra Leona, on the coast of Africa, have, by intermarrying with the natives, and by adopting their manners, become, in a few generations, perfectly assimilated to the negroes, in aspect, figure and complexion.

We see also nations which are considered as being merely colonial, and originally of one and the same race, contract, under a new sky, a different national countenance.

The Hungarians, for example, are referred to the same primitive stock with the Laplanders; but the latter, under the northern zone, have assumed the features most common to the northern nations, while the former, on the contrary, bordering on the temperate zones of Greece and Turkey, have acquired a more elegant form of countenance.

That few of these changes are ascribable to the intermarriages of different people, will be obvious on the slightest inspection; for neither the Jews, nor the Anglo-Americans, nor the European settlers in the Antilles intermarry with the natives of these respective countries. Hence, to climate, and climate alone, are the changes in these people ascribable.

The effect of climate is also augmented by a savage state, and corrected by a state of civilisation. Indeed, by certain states of society, many varieties in the human person are entirely formed. In reality, all the features of the human countenance are modified, and what is properly termed its expression, is radically formed by the state of society.

Now, every remarkable change of feature that has grown into a habit of body, is transmitted to offspring, with other

personal properties. The coarse features of labouring people, created by hardships and long exposure to the weather, are communicated. The broad feet of the rustic, that have been spread by often treading the naked ground, and the large hand and arm, formed by constant labour, are discernible even in children.'

It seems, however, very difficult to assign a reason why this climate causes one, and that, another countenance. Very ingenious men have attempted to account for this, in explaining the countenance of different nations, as Kant in the Mongolic, *in Engel Philosoph für die welt, t. ii. p.* 146. and Volney in the Aethiopic, *Voyage en Syrie et en Egypte, t. i. p.* 74.

Let us for a moment attend to the effects of extreme cold. It contracts the aperture of the eyes; it draws down the brows; it raises the cheek; by the pressure of the under jaw against the upper, it diminishes the face in length, and spreads it out at the sides; and ultimately this becomes the permanent character of northern nations.'

In effect, 'says Volney,' I observe, that the character of the Negro countenance precisely resembles that state of contraction, which our countenance assumes when struck by light, and a strong reverberation of heat. Thus, the eyebrow is drawn down; the tips of the cheeks are elevated; the eye-lids are drawn closer; the mouth is projected. Must not this contraction, which perpetually takes place in the warm and unsheltered climates of the negroes, ultimately become the proper character of their countenance?*

Climate possesses great and evident influence on the hair, not only of men, but of all other animals. The hair gene-

* En effet, j'observe que la figure des Nègres représente précisément cet état de contraction que prend notre visage lorsqu'il est frappè par la lumière et par une forte reverberation de chaleur. Alors, le sourcil se fronce; la pomme des joues s'élève; la paupière se serre; la bouche fait la moue. Cette contraction des parties mobiles n'a-t-elle pas pu et dû á la longue influer sur les parties solides, et mouler la charpente même des os? Voyage en Syrie et en Egypte, par Mr C. F. Volney, t. i. p. 70.

rally follows the law of the complexion; because its roots, being planted in the skin, derive their nourishment and their colour from the same substance which there contributes to form the complexion: its colour may result in part, perhaps, from external heat, and in part from the nature of the substance or secretion by which it is nourished. External and violent heat, parching the extremeties of the hair, tends likewise to involve it.

The colour of various nations may perhaps be explained from the direct influence which air of different temperatures and light of different intensity has upon the blood. Blumenbach is of opinion, that the proximate cause of the dark colour of the skin is to be sought for, in the abundance of the carbonaceous element of the human body, which, together with hydrogen, is excreted through the true skin, but being there precipitated by the access of the atmospheric oxygen, is fixed in the rete mucosum or mucous substance, under the scarf skin.

PART SECOND:

OF THE PARTICULAR EFFECTS WHICH CLIMATE THUS PRODUCES, AND OF THE CLASSIFICATION OF THE SPECIES WHICH RESULT FROM IT.

——— 'Facies non omnibus una,
'Nec diversa tamen.' Ovid. Met. Lib. ii. fab. i.

HAVING delivered those general doctrines, which teach us that climate is the chief cause of the varieties in the form and colour of the human species, we now proceed to those particular observations which point out its specific effects.

The systems of Camper and Blumenbach, are the only ones which exist upon this subject. Both of these refer to the form of the head; both are, in many points, invaluable, and require the detailed account, which I shall now give, adding, at the same time, those observations which circumstances may suggest.

The plan of Camper, I may merely premise, is so general, as to involve all the superior orders of animals, as well as man; and, in that extent, I shall exhibit a sketch of it.

The form of the skull or cranium, differs no less than the colour of the skin, in different individuals; and one kind of its form runs by gentle and almost inobservable gradations into another; yet there is, on the whole, a very remarkable constancy of character in the crania of different nations, contributing very essentially to national peculiarities of form, and corresponding exactly to the features which characterise such nations.

Hence anatomists have attempted to lay down some scale of dimensions, to which the various forms of the skull might be referred, and by means of which they might be reduced into certain classes. Of these endeavours, the facial line of Camper seems to claim the most attention.

The cranium being placed laterally, two imaginary lines are drawn on its surface, to intersect each other at a particular point.

The first proceeds horizontally through the external aperture of the ear, or meatus auditorius externus, and the floor of the nostrils.

The other, or the proper facial line, is continued from the most prominent portion of the forehead above the nose, to the front of the lower, or alveolar margin of the upper jaw-bone. See Pl. I. Fig. 1.

From the angle formed at the junction of those two lines, this excellent anatomist conceived, that we might estimate the differences of the cranium in animals, as well as in the various races of mankind.

A very striking difference between man and all other animals, really does consist in the relative proportions of the calvarium or upper part of the cranium and the face, which are in general indicated by the direction of the facial line.

The two organs which occupy most of the face, are those of smelling and tasting, (including chewing or mastication &c.)

In proportion as those parts are more elevated, the size of the face, compared to that of the calvarium, is augmented.

On the contrary, when the brain is large, the volume of the calvarium is increased in proportion to that of the face.

A large calvarium and small face indicate, therefore, a large brain with inconsiderable organs of smelling, tasting, masticating &c. while a small calvarium with a large face, shows that these proportions are reversed.

Now, the nature and character of each animal must depend, in a great measure, on the relative energy of its different functions; it is, in fact, regulated by its most powerful sensations: we meet with examples of this daily in the human species; but the differences which can be observed between one man and another, in this respect, must be much less than those which occur between animals of different species.

The brain is the common centre of the nervous system: all our sensations are conveyed to this part, which, therefore, is a sensorium commune, or the organ by which the mind combines and compares these perceptions, and draws inferences from them; by which, in short, it reflects and thinks.

We shall find that animals partake in a greater degree of this latter faculty, generally speaking, in proportion as the mass of medullary substance, forming their brain, exceeds that which constitutes the rest of the nervous system.

Since, then, the relative proportions of the calvarium and face indicate also those of the brain, and the two principal external organs, we shall not be surprised to find, that they point out to us, in a great measure, the general character of animals, and the degree of instinct, as it is termed, and docility which they possess; and hence, the study of these proportions is of great importance to the naturalist.

Man combines by far the largest calvarium with the smal-

lest face; and animals increase in stupidity and ferocity, in proportion as they deviate from these relations.

One of the most simple methods, then, (though sometimes indeed insufficient) of expressing the relative proportions of these parts, is the facial line already described. In man only, is the face placed perpendicularly under the front of the calvarium; so that the facial line is in him perpendicular. Hence, the upper and inner angle formed between this line, and the horizontal one, which passes through the nose and meatus auditorius, is most open, or approaches most nearly to a right angle in the human subject. See Pl. I. Fig 1.

The face of animals is placed in front of the cranium, instead of under it: that cavity is so diminished in size, that its anterior expanded portion or forehead, is soon lost as we recede from man. Hence, the facial line is oblique, and the facial or upper and inner angle is acute: it becomes more and more so, as we descend in the scale from man; and, in several birds, and in most reptiles and fishes, it is lost altogether, as the calvarium and face are completely on a level, and form parts of one horizontal plane. See Pl. I. Fig. 1, 2, 3.; and Pl. II. Fig. 1, 2, 3, 4, 5, 6.

The idea of stupidity is associated even by the vulgar, with the elongation of the snout, which necessarily lowers the facial line, or renders it more oblique; hence the crane and snipe have become proverbial.

On the contrary, when the facial line is elevated by any cause, which does not increase the capacity of the calvarium, as in the elephant and owl, by the cells which separate the two tables of the skull, the animal acquires a particular air of intelligence, and gains the credit of qualities, which he does not in reality possess. Hence, the latter animal has been selected, as the emblem of the goddess of wisdom, and the former is distinguished in the Indian language, by a name which indicates an opinion, that he participates with man in

his most distinguishing characteristic—the possession of reason *.

The invaluable remains of Grecian art show, that the ancients were well acquainted with these circumstances: they were aware that an elevated facial line formed one of the grand characters of beauty, and indicated a noble and generous nature. Hence, they have extended the upper and inner, or facial angle, to 90 degrees or a right angle, in the representation of men on whom they wished to bestow an august character. And, in the statues of their gods and heroes, they have carried it beyond a right angle, and made it 100. See Pl. I. Fig. 1

The facial line of the European, (Fig. 2.) forms an angle of 80, and that of the negro, (Fig. 3.) one of 70.

The boundaries of the facial angle in the human subject are, therefore, 70° and 80°. A smaller angle than the former constitutes an approach to the monkey.

Yet it may be extended beyond the latter, as the Greeks have done, in their representations of the gods: here, however, 100° seems to be the *ne plus ultra*, beyond which the proportions of the head would appear deformed: that angle, according to Camper, constitutes the most beautiful countenance, and hence, he supposes, the Greeks adopted it.

Endeavouring to apply these facts to the varieties of the human species in particular, Camper says: it would be impracticable to delineate all the characteristic varieties that exist in nature; we may therefore,

First, consider the Culmuck, as being, with regard to the form of his head, the representative of all Asia (from Siberia to New Zealand) and also of North America; as it is more than probable that the people of that country are descended from the northern Asiatics.

* Vide Cuvier Anatomie comparée.

Secondly, the head of an European may be considered, as a specimen of all Europe, Turkey, Persia and the largest part of Arabia, as far as Indostan.

Thirdly, the head of an Angolese negro may be substituted for all Africa; also for the Hottentots, (who do not materially differ from the negroes); for the Caffres, and for the natives of Madagascar.

In opposition to the doctrine of Camper it may be stated,

First, it is evident that this facial line does not accurately apply, except to those varieties of the human race, which vary from each other in the direction of the jaws, and by no means to those who, on the contrary, are remarkable for a face drawn out laterally.

Secondly, very often in the crania of nations entirely different, the facial line possesses the same direction; and, on the contrary, in many crania of the same people which in general agree in habit, that line is extremely different.

The rule, therefore, does not answer the purpose of distinguishing the varieties of the human race. Where, however, the rule is applied to animals in general, as indicating some of their intellectual faculties, it becomes invaluable. It by no means, however, entirely answers this purpose; and even when most applicable, must be regulated by corresponding observations. Nevertheless, Camper's division of the varieties of the human species, into three, is excellent. The facts, however, adduced by Blumenbach afford the best support of the division, although he has adopted one somewhat different.

Blumenbach, then, also attempts to reduce the national varieties of the human countenance into certain classes; and

he observes, that unless he is utterly deceived, although they be liable to particular exceptions, they are, in the following manner, naturally reducible to five, which may be considered as the heads or sources of the other less important varieties.

The most symmetrical and perfect form of countenance constitutes, as it were, the middle one.

This middle one passes into two extremes, very different from itself, of which one exhibits the face drawn out laterally, the other stretched out inferiorly.

Each of these extremes, again, includes two different varieties, very distinguishable from each other, when viewed in profile. One of these varieties of each has the nose and other parts less distinct and, as it were, confluent. The other exhibits the same parts more deeply excavated and angularly projecting.

Since, however, in distinguishing the characters of different crania, such a view will gain the preference to all others, as offers, at one glance, the most numerous and important points, and such as contribute especially to the comparison of national characteristics, he has found by experience that to be the best adapted to this purpose, in which, from behind the vertex, we behold crania, having their cheek-bones placed in the same horizontal line, arranged in a series. For then, whatever most contributes to the national character of skulls, whether the direction of the jaws or of the cheek-bones, the breadth or narrowness of the skull, the smoothness, or tuberosity of the forehead, &c. at one glance, so distinctly strike the eye, that it is not unfair to call that aspect the vertical rule. See Pl. III. Fig. 1, 2, 3.

There are, then, five principal varieties of the human race, but merely one species; and the innumerable less varieties which exist, mingle together by insensible gradations.

These varieties are the Caucasian, the Mongolic, the Æthiopic, the American, and the Malaiac, equally capable of being defined and distinguished from each other.

It is the Caucasian, which, for reasons afterwards assigned, Blumenbach places first, as to be considered the primitive one.

This, as already stated, passes, on each side, into two very remote and different extremes: on this, namely, into the Mongolic; on that, into the Æthiopic. Other two, as already observed, hold middle places between that primitive one and these two extreme varieties, namely,

The American between the Caucasian and Mongolic, and

The Malaiac between the Caucasian and Æthiopic.

These five varieties seem generally defined by the following characters.

But, to the explanation of these, it is necessary to prefix a double caution, first, that, on account of the multifarious diversity of characters by various gradations, it is not this or that detached one that will suffice, but that many, considered together, are necessary; and secondly, that not even this complex character is so constant, as not to be liable to innumerable exceptions, in all and each of these varieties.

Nevertheless, this is to be so understood, that it may, in general, permit a sufficiently simple and perspicuous notion of them.

The Caucasian variety (Pl. IV. fig. 3.) is of a white colour —ruddy cheeks—hair subfuscous, hazel, or chesnut—head subglobose—face oval, rather straight and its parts moderately distinct—forehead rather plain—nose rather narrow and sometimes slightly arched—mouth small—the anterior teeth of each jaw placed perpendicularly—the lips, (especially the inferior) gently unfolded—and the chin full and round. In general, that kind of countenance which, according to our ideas of symmetry, is thought most handsome and beautiful.

The Europeans, (except the Laplanders and the rest of the Finnish race) the Western Asiatics or those on this side of the river Obi, the Caspian sea and the Ganges, and the inhabitants of northern Africa; in short, all the inhabitants of the world, as known to the ancients, belong to this first variety.

This variety derives its name from Mount Caucasus, both because its neighbourhood, and chiefly its southern region produces the Georgian and Tshercassian, the most beautiful race of men; and also because all physiological reasons conspire to prove, that the first progenitors of the human race, were, in all probability, placed here.

For, in the first place, we see this race possess that form of cranium, from which, as from a middle and primigenitive configuration, the rest, on each side, to the two remotest extremes, one the Mongolic, the other the Æthiopic, flow by the simplest gradation.

Next, it possesses that white colour, which it is also reasonable to reckon the primitive one of the human race, since, from it, degeneration most easily takes place into black, but much more difficultly from black to white, because the secretion and precipitation of that carbonaceous pigment, once inveterate, retains its root.

"The blood of Georgia," says Chardin, "is the finest of the east, I may say of the whole earth. In that country, I have never observed, in either sex, one disagreeable countenance, but I have often seen angelic ones. Nature has, there, diffused over the greatest number of the women, graces which are no where else to be seen. I conceive it to be impossible to behold them without loving them. Painting cannot display more charming countenances, on more elegant forms, than those of Georgians."

The women of Circassia, Struys remarks, are likewise exceedingly fair and beautiful. This complexion consists of the most delicate tints. Their foreheads are large and

smooth; and, without the assistance of art, their eye-brows are so fine, that they resemble curved threads of silk. Their eyes are large, attracting and full of animation. Their noses are well shaped, and their lips are perfect vermilion. Their mouth is small, but the perpetual residence of smiles: their chin is the termination of the completest oval. Their neck and throat are extremely handsome: their skin is white as snow: the colour of their hair is a beautiful black: their stature is tall; and their carriage easy. Belon also asserts that there is not a wife of any labourer or rustic in Asia (Turkey), who has not a skin so polished, that it feels like fine velvet *.

The Mongolic variety, (Pl. IV. fig. 1.) is of yellowish or buff colour—hair black, rather rigid, straight and scarce—the head, as it were, square—face broad, at the same time plane and depressed; its parts, therefore, less distinct and as it were confluent—the glabella plain and very broad—the nose small and flat—the cheeks almost globose, and projecting outward—the aperture of the eye-lids narrow and linear—and the chin slightly prominent.

This variety embraces the other inhabitants of Asia, (excepting the Malays of the extreme Transgangetan peninsula,) the Finnish people, Laplanders &c. of northern Europe, and the nation of the Equimoes, widely diffused over the most northern parts of America, from the strait of Bering to extreme inhabited Greenland.

This is the same which once was commonly, but in an ambiguous and vague sense, called the Tartaric. That denomination, however, in the study of the varieties of the hu-

* "Il n'y a femme de quelque labourer ou rustique en Asie (Turquie), "qui n'ait une peau si polie, qu'il semble toucher à un fin velours." Observations de Belon, p. 198.

man race, has given origin to strange errors; so that, as an example, Buffon and his successors, misled by this appellation, have erroneously transferred the national characters of the Mongolic variety, used by ancient authors who described them under the name of Tartars, to that people, who, without doubt, belong to the first variety which we have described.

The Æthiopic variety, (Pl. IV. fig. 5.) is of dark colour—hair black and woolly—head narrowed and compressed laterally—forehead gibbous and arched—cheek-bones projecting forward—eyes rather prominent—nose thick and somewhat confused with the extending jaws—the alveolar outline rather narrow and elongated anteriorly—the anterior front teeth obliquely prominent—the lips (especially the upper) tumid—the chin retracted—and, in many instances, the legs bandy.

To this variety, all the Africans, except the northern ones, belong.

The small progress of negroes in the study of the sciences and in civilization; their decided taste and singular aptitude for all the arts that require more address than understanding and reflection, as dancing, music, fencing &c.; the form of their head, which is in a medium between the European and Orang-outang*; the existence of intermaxillary bones at an age when, in us, the traces of their separation are completely obliterated; the high situation and smallness of the calf of their leg, &c. have been advanced as arguments, which, however true and good as proofs of physical and mental inferiority, are totally inapplicable to the purpose of those who have endeavoured to degrade this portion of the human species, with a view of justifying the commerce made of it by civilized nations, and the slavery to which it is reduced.

* Cuvier, Leçons d'Anatomie comparée.

The American variety, (Pl. IV. fig. 2.) is of a copper colour—hair black, rather rigid, straight and scarce—forehead short—eyes deeply seated—nose somewhat flattened, yet prominent—in general, a face indeed broad with eminent cheek bones, yet not plain and depressed, but its parts, if viewed laterally, more elaborated, and, as it were, more deeply excavated—the form of the forehead and crown very artificially constructed.

The inhabitants of America, except the Esquimoes, compose this variety.

The number and the kind of fictions, respecting the national character of the American variety, which were at one time propagated, were at once amazing and disgraceful.

Some denied a beard to the men; others menstruation to the women. Some ascribed to all and each of the Americans, one and the same colour; others, a countenance perfectly similar.

As to the cutaneous colour of this variety, it is, on the one hand, no where so constant, but that it frequently verges to black; and, on the other part, causes appear, both from the nature of the American climate, and from the laws of degeneration applied to the probable origin of the Americans from northern Asia, why they should not be so liable to great diversity of colour, as the other descendants of Asiatic progenitors, who inhabit the ancient world.

The Malaiac variety (Pl. IV. fig. 4.) is of tawny colour—hair black, rather soft, curled, dense and thick—the head moderately narrowed—the forehead subtumid—the nose rather full, slightly broad, as if diffused, and with an apex rather thick—the mouth large—the upper jaw somewhat prominent—but the parts of the face, viewed laterally, sufficiently prosilient and distinct from each other.

This last variety includes the islanders of the south sea, together with the inhabitants of the Mariane, Phillippine, Molucca and Sunda isles, and of the peninsula of Malacca.

As the American variety of the human race, in respect of national habit, holds. as it were, a middle place, according to Blumenbach, between the Caucasian and one of the two extremes, namely, the Mongolic; so the Malaiac makes a similar passage from that middle variety to the other extreme, namely, the Æthiopic.

It is fair to call it the Malaiac, because by far the greatest part of this variety, especially those who are contiguous to the Indian isles of Malacca, as well as those who inhabit the Sandwich, Society and Friendly islands, and also the people who inhabit the islands extending from the coast of Madagascar to the isle of Passover, use the Malaiac idiom.

From all this, Blumenbach concludes, that there is even here an insensible transition, by which all the varieties, as we see, flow together; and which, compared with what we know concerning the causes, manners and phenomena of degeneration in domestic animals, at last leads to that conclusion which seems spontaneously to flow from physiological principles, applied, by the aid of critical zoology, to the natural history of the human race, namely, that there remains no room to doubt of its being accurately proper to refer to one and the same species, all and each of the varieties of men which have hitherto been observed.

PART THIRD:

FURTHER EXAMINATION OF THE FORM OF THE HEAD, AND OF THE CRITERIA OF INTELLECT WHICH IT PRESENTS.

No Man, when he is speaking of the Beauty of any Form, unless he has some Theory in his Mind, thinks of ascribing it to the peculiar nature of the Form, or of describing its Beauty to other People, as consisting in this Form.
ALISON'S ESSAYS, Vol. I. P. 341.

SŒMMERRING has observed that the brain of man is largest, compared with the nerves given off from it, and that the magnitude of the former, above that of the latter, or in other words, the magnitude of the area of the cranial cavity above that of the face and spinal marrow, affords an accurate criterion of the intelligence which animals possess.

This curious observation (observes another physiologist) is, however, inaccurate; because all reasonings which at once involve the cerebrum and cerebellum—the greater and less brain, or, in other words, the cerebral and cerebellic cavities, must be false; for this cause, that, while, in two different animals, the relative magnitudes of the general cavity and of the face are the same, the relative magnitudes of the cerebral and cerebellic portions do often differ,

and occasion the greatest possible difference in the intellectual powers of the animals.

Finding this observation of Sœmmerring thus inaccurate, the same physiologist has been induced to seek more cautiously in a similar source for a perfect criterion.

In order to explain the criteria which he has discovered, it must be observed, that the perceptive and voluntary functions may be very variously combined.

That the organs of sense are the organs of sensation, is questioned by no one; that the brain is the organ of intellect, is also granted; and, in this view, it only remains to be determined, what is the organ of volition.

The cerebellum then appears, from various observations, to be the organ of volition.

As sensation and volition seem exactly opposed to each other, so is the face, containing the organs of sense, to the cavity containing the cerebellum. This analogy also attends their situation in all animals; for as, in the inferior classes, the face advances, so the cerebellum uniformly recedes, and both are generally separated from the cerebrum, either by membranes or by bony plates. Several animals have a bony tentorium between the cerebrum and cerebellum, as they have bony plates between the cerebrum and face; others (most birds) have only membranes between the cerebrum and face, as they have a membranous tentorium between the cerebrum and cerebellum.

The cerebellic cavity, moreover, seems uniformly to commence on the inside of the base of the cranium, exactly opposite to the place where the face, or lower jaw terminates on the outside.

Now, from the peculiar opposition which subsists between the situation of the face and cerebellum, we are intitled to expect a similar opposition in their functions. As the face, therefore, occupied by the chief organs of sense, is the seat of sensation, so we might expect the cerebellum to be the seat of motion, or rather the organ of volition.

This supposition receives additional force, from the consideration that, as the organs of sense and the cerebellum are the first and the last portions of the nervous system, so sensation and volition are the first and the last of its functions.

The inferior animals, too, however defective in intellect, possess motion; and, in almost all of them that have any visible nervous system, a cerebellum—the organ of motion, exists.

But this supposition is completely confirmed, when we recollect, that the degrees of voluntary power always bear a close analogy to the various magnitudes of the cerebellum. In fishes, for instance, which possess amazing locomotive power, the cerebellum is often larger than the cerebrum.

Man, also, has the greatest cerebrum, compared with his cerebellum; and has likewise most intellect, though not most of locomotion.

The proportion of the brain, therefore, to the medulla oblongata, or to the rest of the nervous system, is not, as asserted by Soemmerring and Ebel, an exact criterion of the degree of intelligence an animal enjoys, because it is not, as they supposed, the index of the pre-eminence which the organ of *reflection* preserves over those of the *external senses.*

It is not, either, as some of them have supposed, the cerebellum, but the face, which is the proper organ of the external senses; and the function of the cerebellum is, as has been shewn, very different indeed.

Neither, as appears from these observations, does the cerebellum bear such uniform and evident relation in size to the face, as to permit its being thus substituted for it. The exception of the dolphin alone subverts it.

This comparison between the cerebrum and cerebellum shows merely the proportion of intelligence to locomotion.

Thus, then, we have determined the seats of the three

great intellectual functions, and we know that their energy, *in perfect health,* must precisely correspond with the developement of their organs.

The criterion, then, first of *intelligence* which this physiologist has pointed out, is afforded by the proportionally greater magnitude of the *cerebrum,* compared to the face and cerebellum; the criterion of sense or *sensation* is afforded by the proportionally greater magnitude of the face or, more properly, of the *organs of sense,* compared to the cerebrum and cerebellum; and the criterion of *volition* or of locomotive power, is afforded by the proportionally greater magnitude of the *cerebellum,* compared to the organs of sense and the cerebrum.

From every observation which we have been able to make, those criteria appear to be correct. Nor is it possible, that any criterion can be correct, which does not thus involve *all* the intellectual organs, and consider *each* with relation to its particular function.

Now, these three criteria of sense, intellect and voluntary motion, certainly, are strictly and beautifully applicable to the varieties of the human species. For the area of the cerebral cavity of the European skull is uniformly greatest, compared to the area of the face and of the cerebellic cavity; while Æthiopic and Mongolic crania, without differing in general relative magnitude, (for what the Mongolic has in breadth, the Æthiopic has in height), seem strikingly to differ in this, that the area of the face is actually greatest in the Æthiop, compared to the area of the cerebral and of the cerebellic cavity, while the cerebellic cavity is actually greatest in the Mongol, compared to the area of the face and of the cerebral cavity *.

Thus, the Æthiop, having proportionally the largest organs of sense, ought to have the strongest sensation; the European, having proportionally the largest cerebrum, ought

* See PROOFS of this in APPENDIX, No. I.

to have the greatest intellect; and the Mongol, having proportionally the largest cerebellum, ought to have the greatest volition. Very beautifully all this is confirmed by the very habits of these varieties; for, while the northern people have the dullest sensations, they are the most active men on the earth, and while the negroes have the acutest sensation, they are the most indolent *.

It remains only to explain the difference in intellect between the Mongol and Aethiop, since, while their cerebral cavities are, upon the whole, of equal magnitude, that of the Mongol is broad, and that of the Aethiop high †. From this circumstance an intellectual difference *must* proceed. But the natives of colder countries have, with regard to intellect, been rather distinguished for calculation and mathematical talent, while those of hot, have, even in the common expressions of their language, been remarkable for imagination and poetical talent. Now, it is to be observed, that the common expressions of a language, afford a stronger argument on this subject, than the production of a few great poets, whose existence depends more on such incidental circumstances as general illumination, political freedom &c. which have more frequently fallen to the lot of northern nations. This being the case, no supposition so *probable* presents itself, as that the calculatory or mathematical talent of the one, is connected with his breadth of cranium, and the imaginary or poetical talent of the other, with his elevation of cranium.

In confirmation of this, it is worthy of notice, that considerable breadth of the upper part of the head is allowed, even by the most superficial observer, to give an air of sagacity; while great elevation, especially of the forehead, as in Charles XII. and a multitude of great men, gives a

* See PROOFS of this in APPENDIX, No. II.

† See also PROOFS of this and of several succeeding facts in APPENDIX, No. I.

strong impression of imagination. Even in inanimate objects, breadth gives the appearance of stability and permanence—terms which, though here physically used, are by the very habitude of language, in a moral sense, applied rather to calculatory or mathematical talent—to sagacity than to imagination; and, in the same objects, height gives the appearance of lightness and elegance—terms which, though here physically used, are also by the habitude of language, in a moral sense, applied rather to imagination than to sagacity. Hence, it is with strong reason, that breadth of cranium is here supposed to indicate stability and permanence, and height, lightness and elegance, or brilliance and intensity of function.

The physiologist above alluded to, therefore, proposes the arrangement of the human race into three varieties, founded at once upon physical form and moral habit—the physical form of three different organs, viz. those of sense, the cerebrum and the cerebellum, and the consequent energy of the sensitive, perceptive and voluntary powers, exercised by these organs.

That form and this energy, is proposed as the basis of all such classification, in lieu of the merely physical, and that, too, insulated basis of Camper, Blumenbach and others; and whether it lead to the adoption of three, or five, or any greater number of varieties is immaterial. The *nature* of the basis is that for which alone we contend. It, moreover, not only affords a natural classification of the human race; but presents the principles of a natural, simple and impressive system of physiognomy.

With regard to the different character of male and female crania, the same physiologist has ascertained, that when the cavity of the male and female cranium is of equal length, the portion before the cavity of the pituitary gland, is longer in the male than in the female; while that behind it, is longer in the female than in the male.

Now, in the anterior part of the cavity, are lodged those medullary fasciculi, through which impressions ascend to the common sensorium; and, in the posterior, those through which they descend*. Hence, it is *probable*, that the ascending impressions are stronger in the male; the descending, in the female. And, in perfect *conformity* with this, we find that more numerous and stronger impressions in the male, more rarely and weakly excite emotions and passions; whereas fewer and slighter impressions in the female, more frequently and more strongly excite emotions and passions.

But, as the male cranium is widest posteriorly, even in cavities of equal length, the rarer and weaker emotions and passions of the male are, consistently with the preceding doctrine, more permanent than those of the female.

The female calvarium seems in general also narrower than that of the male; and hence, all her mental operations, though more brilliant and intense during their continuance, have, on the same principles, less permanence.

Though these characteristics have, in the preceding part of the paper, been applied only to the varieties of the human race, and to different ages and sexes, yet, it is obvious, that they all apply with equal correctness to individuals of whatever description; and that they, therefore, constitute the first principles of physiognomy, *which have not hitherto been thus founded on physiology.*

Thus, organs of sense greatly developed, in comparison to the cerebral and cerebellic cavities, indicate the pre-eminence of sensation, and a diminished degree of intellect and voluntary power; the cerebral cavity greatly developed, in comparison to the organs of sense and the cerebellic cavity, indicates the pre-eminence of intellect, and a diminished degree of sensation and voluntary power; and the cerebellic

* See the Report of the Committee of the National Institute of France, on Gall and Spurzheim's Paper on the Brain, with Critical Observations, in the ARCHIVES of UNIVERSAL SCIENCE.

cavity greatly developed, in comparison to the organs of sense and cerebral cavity, indicates the pre-eminence of voluntary power, and a diminished degree of sensation and intellect.

In order to ascertain the magnitude of these organs in the living body, the process is simple: that of the organs of sense is obvious to every observer; so is that of the cerebrum; and that of the cerebellum is easily ascertained, as, in all the superior animals, it begins precisely opposite the place where the face terminates, that is, opposite the articulation of the lower jaw, which is immediately before the ear, and extends to the spine which projects from the occiput.—In both the last cases, allowance is to be made for varieties in the thickness of the cranium, which are rarely very remarkable.

Thus, we possess the means of ascertaining the degrees of the three simple powers, sensation, mental operation and volition, in man and all the superior animals, in whatever proportion they may be combined.

Moreover, wherever these organs are elevated, there their functions are brilliant or intense; wherever they are wide, there they are stable and permanent. Thus, the elevated cerebrum indicates genius and imagination; the broad one, the more mathematical talent: when the cerebrum is longest anteriorly, there preception and observation excel; and when it is longest posteriorly, there reflection and passion excel: when the cerebrum is elevated before and depressed behind, there the perceptions are brilliant or intense, the reflections less so; and when it is depressed before and elevated behind, then the perceptions are less, the reflections more intense: when the cerebrum is broad before and narrow behind, then the perceptions are more permanent, the reflections less so; and when it is narrow before and broad behind, then the perceptions are less permanent, the reflections more so.

For a further illustration of these criteria of intellect, see Plate V. representing an exquisitely formed cranium from the Decades of Blumenbach. The skull is that of a young Georgian female, who fell into the hands of Russians at the siege of Oczakoff: dying at Moskow, the head, as distinguished for beauty, was sent by Professor Hiltebrandt to Blumenbach. A sketch of it has been chosen here for the illustration of the preceding principles... The inscriptions on the plate itself, if examined along with the preceding paragraph, render this doctrine perfectly simple.

Now, the various combinations of these various degrees of sensation, mental operation and volition, give origin to all the passions and habits of life; so that these passions and habits by no means require distinct organs, as Gall has supposed: they are compound in their nature, and result from the combination of these various degrees of these simple powers.

With regard, however, to the system of Gall*, it is worthy of notice that, unscientific and empirical though it be, yet, in a few instances, he has approached to the truth. Thus, in placing the absurd organs of vanity, loftiness and theosophy, on the top of the head, he has either empirically or accidentally approached the simple truth, that imagination depends on the developement of the cerebrum in height; in placing the equally absurd organ of courage on each side the head above the ear, he has approached the simple truth, that permanence or firmness of function, depends on the developement of the cerebrum in breadth; in placing a variety of petty organs, of number, place, things, persons, words &c. on the forehead, he has either empirically or accidentally approached the simple truth, that preception and observation depend on the developement of the anterior portion of the cerebrum; in placing the organ of parental and filial

* See an Account of his doctrine in the APPENDIX, No. III.

love on the back of the head, he has also approached the simple truth, that reflection and passion depend on the developement of the posterior portion of the cerebrum; and in placing the organ of sexual love in the cerebellum, and exemplifying this by the greater magnitude of this part, and the greater vigour of this function in the bull, &c. he has likewise approached the simple truth, that muscular power of *all* kinds, depends on the developement of the cerebellum. Gall, however, has not only erred, even with regard to these organs, by mistaking their nature and limiting their sites, but he has still more egregiously erred throughout, in assigning a multitude of *simple and distinct organs,* for *functions, which owe their existence to a combination of others.*

In order, then, to ascertain the frequent existence of any passion, or habit of mind, the search for minute and distinct organs must be abandoned; but, it is only necessary to ascertain the existence of the signs of those degrees of the simple powers, which are requisite to constitute the passion or habit, than which, according to the preceding principles, nothing is more easy.

PART FOURTH.

PHYSIOGNOMICAL DETAILS, AS FOUNDED ON THE PRECEDING PHYSIOLOGY.

"When we say that a countenance is noble, or magnanimous, or heroic, or gentle, or feeling, or melancholy, we convey at once to every hearer, a belief of some degree of sublimity or beauty; but no one ever asks us to describe the form of the features which compose it."

Alison's Essays, Vol. II. page 270.

HAVING thus established the first principles of physiognomy, founded, as they ought to be, on a comparative view of the three great organs of sensation, mental operation and volition, we now, assisted by the same guide, proceed to its minuter details.

The minute details of physiognomy are not to be found in any investigation, either of the superior, or posterior part of the head, as Gall has absurdly attempted. The reasons of this are obvious. First, the superior and posterior part of the head, present only one or two organs uniformly constructed, except with regard to the great and more general deviations which have been already explained; and consequently no minute forms are to be discerned on them, super-

ficially examined. Secondly, the whole superficies of these organs is covered by the skull, somewhat irregular in its thickness, so as to render it difficult to calculate what may be the minute conformation of the subjacent parts. Thirdly, the skull covering these organs is itself covered with hair, so that any examination of them is thus rendered still more difficult. Fourthly, the dress of most nations presents an additional obstacle.

Nature, however, seems admirably to have preserved one of the great mental organs, open for our inspection. The face, containing the organs of sense, presents every possible advantage for the purpose of physiognomical examination. First, it exhibits many organs, each of which may be separately and distinctly examined. These organs, it will be found, present, if we may use the term, a kind of analysis of sensation : or, in other words, while in some of the inferior animals, one and the same organ (as the horn of the snail) receives every kind of impression, and is sensible to light, to sound, to odour, to taste and to touch; in man, transparent lenses transmit the rays of light; tense mebranes receive the concussions of sound; a convoluted organ receives the impressions of the odours which are wafted through the nose, in the air which we respire; the moist papillæ of the tongue receive the impressions of taste; and the delicately conformed and highly sensible tips of the fingers receive those of touch. Secondly, in the face, the soft parts, or rather the organs of sense, are quite superficial, and not separated from our view by osseous matter. Thirdly, little or no hair; and, in general, no mode of dressing covers these organs.

These reasons for preferring the face, for the purpose of physiognomical observation, are precisely the counterpart of those which prevent the examination of the superior and posterior part of the head.

From a vague perception of this truth, it has probably arisen that the face in particular has ever been the principal subject of physiognomical observation, and forms almost the sole one of the celebrated Fragments of Lavater *.

But nature presents other, and perhaps still more beautiful, reasons for this preference of the face. All mental operation, and all volition is dependent upon sensation. By the face being left thus exposed, we are enabled not only to point out the capabilities of men with regard to sensation itself; but, as all effects are dependent upon corresponding causes, we are also enabled, in some measure, to predict the mental operation and the volition which may result from given powers of sensation.

Moreover, the face thus presents not only organs of sense, or organs of impression; its muscular parts are all under the guidance of the will, or of the organ of volition. Hence, the state of these muscular parts beautifully indicates the acts also of that organ on which they depend. So that the face presents organs of volition as well as those of sensation.

Now, had organs of sense alone been exhibited in the face, we could not infallibly have predicted the extent of mental operation; because, although no acts of the mind *inconsistent* with the obvious capacities of the organs of sense could have taken place, yet mental operation might have advanced to no very great extent. For it often happens, that the sensations, as in the negro, are strong, while the mental operations and volitions are weak. The existence in the face, however, of organs of volition, as well as of organs of sensation, enables us accurately to predict the precise extent to which mental operation has advanced, because all the acts of volition are the result of preceding mental operation, and could not have existed without it.

* See some Remarks on his doctrine in the APPENDIX, No. 4.

It is of much importance to attend to this fact. Like the preceding ones, all physiognomists have neglected it.

As the face thus presents organs of two kinds, this is its greatest and most general division; and the first rule of physiognomy, applicable to the face in particular, results from examining the predominance of one of these sets of organs over the other—of those of sense over those of volition, or *vice versa.*

Some countenances express great sensibility and little voluntary power. Hence, the vulgar often point out a species of beauty in countenances which they nevertheless grant to have little expression. Now, the truth in this case is explained by the rule that, *some countenances present beautifully formed organs of sense and perhaps much sensibility, but no strongly delineated muscular parts, and consequently no proof of powerful mental operation; or, in other words, they have little expression: other countenances present strong muscular traits and much expression, but less beautifully formed organs of sense and less sensibility.*

Some nations, as those of the East Indies, possess the former of these characters, namely, a fine oval form of face, beautifully shaped eyes and nose, and lips admirably curved, and, along with these, much sensibility; yet they have little expression, because the muscular parts of their face are scarcely apparent. This observation is also in general applicable to the faces of women, compared with those of men . . . Other nations again, as those of Europe, possess the last of these characteristics, viz. strong muscular traits and much expression, but less beautifully formed organs of sense and less sensibility. Such also is, in general, the case with regard to the faces of men, compared with those of women.

Thus, we have established the first and most general physiognomical rule that can be derived from the face individually considered.

Let us now examine the organs of sense in particular. The number of these organs first demands our attention.—*Why are these organs precisely five in number?* This is a question well worth being put: The answer is not difficult. These organs are five in number, because there are just so many states of matter capable of affecting animal bodies, and such a number of media in which they are involved. These are, solids which affect touch, liquids which affect taste, fluids which affect smell, aeriform vibrations which affect hearing, and light which affects the sight. The states of matter, properly so called, are indeed only three, namely, solidity, liquidity and fluidity, and require only three organs, namely, those of touch, taste and smell; but it is obvious, that the other two senses, of hearing and seeing, were indispensable to such a perfectly organized animal as man, in consequence of his being enveloped in the two great media of the atmosphere and of light. Had still other media existed, there would have been still other senses. The states of matter, then, and the media are precisely five in number; and hence, the organs of sense are precisely five.

Another curious and important question is—*Why are some of the organs double and others single?* Now, nature seems desirous of rendering impressions in the more perfect animals as numerous, extensive and powerful, as is consistent with their organization. Hence, instead of one organ of sense, like the Zoophytes, she has given them five; and, instead of these being single organs, she has doubled them whenever it was possible; and has permitted them to be single, only in those cases where certain other circumstances —certain complex offices which they had also to perform, rendered the doubling of them impossible. Thus, the ear performs only the office of hearing, and, consistently with this principle, it is double. The eye performs only the office of seeing, and, in similar consistency, it is also double. But the nose and the mouth do not perform *only* the res-

pective offices of smelling and tasting—they perform also that of speech. Now, it was necessary that the voice should be single: two sounds at once emitted would have led to utter confusion. Hence, the nose and mouth are each a single, and not a double organ. It is true that these form *two* different organs thus performing *one* function—the function of voice; but it is worthy of notice, that nature has beautifully adapted them for the performance of distinct portions of that one function: articulation consequently takes place in the mouth; resonance, in the nose. Thus, admirably does nature conform to the general principle above enunciated. It is further worthy of notice, that these two organs, in so far as they are *two different* organs of sense receiving impressions from *without*, are *externally* Separate; and in so far as they form *one and the same* organ of voice proceeding from *within*, they *internally* Communicate.

A third question not less worthy of notice presents itself —*Why have these different organs situations so very different;* two of them, the eye and the ear, being placed superiorly, and two, the nose and mouth, inferiorly? Now, the reason of this is equally obvious. The eye and the ear are elevated in order to command objects placed at as great a distance as possible; and the nose and mouth, which do not receive impressions from a distance, are placed below, in order to permit a ready communication with the lungs and stomach. Nothing, moreover, could have been more inconvenient, than the situation of the nose and mouth above the eye and ear, not only as it would have elevated senses which do not command distant objects, above senses which ought to command them, but as it would have required an unnecessary length of the canals, to communicate with the lungs and stomach, and would also have exposed those nobler organs—the eye and the ear, to injury from food, &c. The reason, also, why the ear in particular is placed behind the eye, is, that while the objects of our vision occupy a li-

mited situation and can best be inspected by an organ placed before, sounds, on the contrary, are diffused all around and can more completely be impressed on organs situate on each side. Ample room is thus also given to the organs necessarily placed before—a situation which, in consequence of man's having the power of moving only in one direction, is rendered evidently the best. The reason, moreover, why the nose is placed higher than the mouth, is not only that it is destined to command objects—odours namely, at a greater distance than the mouth, which for the purposes of taste must have liquids brought into actual contact with it, but there is another reason for their situation, which has a very beautiful reference to their use, as the organ of voice. All resonance (of which the nose, as we have already stated, is the organ) tends to ascend; and hence, the nose, in order to perform that office—to permit resonance, must be placed superior to the mouth—the organ in which articulation is actually produced.

These three very curious and interesting questions, have, till lately, been utterly neglected; and, with regard to the last, it may justly be observed, that if it be worth the while of the naturalist to remark that the habit of the Chondropterygii, of lying always on their belly, renders it necessary for them to have eyes in the back of their head, as is exemplified in the skate, for eyes in the front would be buried in the sand;—if this be worth his while, it surely cannot be unworthy of the physiologist to assign the reasons for the situation of individual organs in the noblest of all animals.

Now, as the first rule of physiognomy, derived from the consideration of the face, was founded upon its consisting of organs of two kinds, namely, organs of sense or impression, and organs of volition or expression; so the second is founded on the former—the organs of *sense* thus generally considered. It is, that *with regard to each of the organs of sense, coarse or defective construction indicates coarse or defective*

sensibility; and, on the contrary, delicate and perfect construction indicates delicate and perfect sensibility.

We have next to inquire into the best order of enumerating, or arranging the organs of which we have thus explained the number, the circumstance of their being double or single, and the different situation. Some enumerate them thus: organ of touch, of taste, of smell, of hearing, of seeing; and others exactly reverse this order; yet no one has hitherto assigned a reason for doing so. The truth is, that both arrangements are equally good. The first, commencing with touch, is the order of the *accuracy* of these organs; for touch is the most accurate of the senses, because it consists in the actual contact of solids, which are the least variable state of matter; taste is less accurate, because it consists in the contact of liquids, which are still more variable; smell is still less accurate, because it consists in the contact of fluids, which are more variable still; and hearing and seeing are least accurate of all, because they do not consist in any actual contact, but depend upon the interposition of media—air or light. Hence, the echo utterly deceives us, as to the direction of sound, and the oar which appears perfectly straight in the open air, seems bent when partially plunged among water. This, then, is the order of their accuracy . . . The opposite order, commencing with the sense of sight, is the order, if we may so term it, of their dignity or nobility. The eye is the noblest organ, because it commands objects at the greatest possible distance; the ear commands objects which are nearer; the nose, those which are still nearer; the taste, those which are nearer still; and the touch, those which are nearest of all—in actual contact.

Upon this appropriation to objects situate at different distances, depends the third great physiognomical rule, applicable to the face in particular. This is, that *a more developed and perfect form of any one of these organs, than of the rest, indicates the capability of receiving more perfect*

impressions from that particular species of object for which the organ is calculated, and also a capability of those more or less noble intellectual operations which most readily flow from such impression. Thus, although all the senses are subservient to the pleasures termed sensual, in opposition to those which are reckoned more purely intellectual, yet it is evident that some senses, as the mouth and even the nose, are more completely subservient to sensual pleasure. Hence, (to illustrate the preceding rule) their greater developement, as in the brute, will indicate rather a susceptibility of sensual than of intellectual pleasure; and, on the contrary, their being of moderate size and delicately constructed, will indicate a more moderate and delicate sensuality. On the contrary, the greater developement of the eye and ear—these nobler organs, to which alone the fine arts are addressed, will only indicate the greater capacity of these organs, for impressions in general, whether of a sensual or of an intellectual kind.

Before proceeding to examine the individual organs of sense, it will be obvious to every one, that, as they are organs of sense, and not of mental operation, physiognomists have erred in endeavouring to point out in them, *direct* indications of judgment and other faculties which belong entirely to mental operation, and can be *directly* indicated only by the form of the superior part of the head, in which the organ of mental operation is situate. Nevertheless, the organs of sense may be said to present *indirect* indications of such mental qualities, because their existence may, in some measure, be predicted from certain degrees of sensibility, which the organs of sense themselves express; and the muscular or voluntary parts especially give such indications, because the acts of the will, which they obey, never take place unless preceded by mental operation.

It is, however, worthy of notice, that although muscular parts or organs of volition enter into the composition of the

face, yet all the motions which they perform, although we may denominate them expressive, are performed by no means exclusively for any such purpose as *expression*, but primarily for the purpose of rendering those organs of sense, with which they are connected, more fit for the reception of *impression*; and, consequently, their first and principal reference is to sensation and not to volition. This, however, is attended with no inconvenience, because the organs of sense, thus influenced by the voluntary powers, enable us to calculate the degree of other functions.

Let us now examine each of the organs of sense in succession, commencing with the eye.

In connection with this organ, it is not necessary again to repeat what was said of the forehead. Its form, with regard to height, breadth and convexity, is involved in the previous consideration of the three great intellectual organs, and in that of the cerebrum or organ of mental operation in particular, with which it is chiefly connected.

An eye of great magnitude indicates a capacity of receiving more powerful sensations of vision; *because* the power of all organs, *equally healthy*, is ever in proportion to their developement.—Hence it is, that the frugivorous mammalia which climb trees have in general the eye large; hence also it is, that animals with large eyes discern objects with less of light; and hence it likewise is, that fishes which are destined to live in an obscurer medium have these organs of great magnitude . . . *A small eye*, on the contrary, presents less capacity in this respect.—Hence it is weak in the mole &c.

An eye projecting greatly from the orbit most readily receives impressions from every surrounding quarter—a circumstance which presents its own explication.—Hence, how-

ever, persons with eyes thus protruding, seem ever in search of enjoyments; and indeed always are the slaves of some powerful passion . . . *The deeply seated eye* has the opposite disadvantage, and is less readily impressed.—Hence, such an eye has a death-like or cadaverous appearance, and the persons to whom it belongs are colder in their feelings, or have less sensibility, and are less under the influence of particular passions.

When the eye-brow, by its motions, adds to the depth of the eye, it indicates discernment; *because* such motions depend upon a voluntary employment of certain muscles in order accurately to adapt the eye to the objects examined.—Hence, the eye-brow is thus depressed where any object is closely examined; hence also the hand is raised over the eye to aid in the same purpose; and hence men of discernment, when reflecting, are, by association, led thus to employ the muscles of the eye-brows in undulating or compressing them, even when no particular object is before the eye. For the same reason, the elevated, undulated and compressed bony and feathery projection over the eye of the eagle, and the projection of similar form over the eye of the serpent give a similar expression of accurate discernment; and they actually do indicate it, because, like the corresponding prominence in man, they exclude unnecessary rays of light, and give a more accurate view of objects.—As the eye-brows are seen to be thus undulated and compressed in paroxysms of anger, they are supposed by the vulgar only to indicate anger; but the reason that they are then compressed is, because, in paroxysms of anger, the object which excites it is most keenly inspected. . . . *An eye-brow greatly elevated,* on the contrary, indicates the absence of severe thought &c.

Eye-lids widely expanded, so as to give a round form to the eye, resembling its appearance in the cat, owl &c. indi-

cate keen inspection, but no sensibility; *because* it is evident, that the eye-lids are thus habitually opened in order to receive a fuller view of the object inspected; the impression it has already made, being insufficient.—Hence, in most fishes which are distinguished for voracity, there is no moveable eye-lid; and hence, also, when mysterious or surprising objects are before us, the eye-lids are expanded in amazement... On the contrary, *eye-lids which nearly close over the eye,* indicate less keen perception, but greater sensibility. —Hence, when the eyes receive too strong impressions from the light of the sun, the eye-lids are more approximated; and hence, too, when a beloved object is before us, and the whole mind is filled with its image, the eye-lids also gradually close.

An iris of dark colour indicates more accurate inspection and firmer character; *because,* by its means, all the scattered rays of light are absorbed; the iris thus excited, diminishes the pupil; and the images of objects passing into the eye are rendered more definite and hard.—Hence, this colour of eye is best suited to the male countenance... On the contrary, *an iris of light blue colour* indicates less accurate inspection and softer character; *because,* by its means, some scattered rays, and in general a larger image, is permitted, and the impressions of objects are rendered more indefinite and soft.—Hence, this colour of eye best suits the feminine countenance.

The magnitude of the ear, like that of all other organs, doubtless indicates its greater capability. It is probable, however, that its susceptibility of impression also, in some measure, depends on *its general thinness,* since we find that

animals of very acute ear have the organ not only large, but very thin, as in the cat, hare, rat, mouse, bat &c.

The degree of the projection of the ear, doubtless contributes to the more ready collection of impressions; yet, as ears which project, are generally, at the same time, turned forward, they more nearly resemble those of quadrupeds, and will be adapted chiefly to impressions from before; while, at the same time, they are incapable of turning, like those of quadrupeds, in any other direction.—Hence, such ears are defective, and much inferior to the flattened and more beautiful form, by means of which impressions from various directions are more easily received.

An ear which is long between its upper margin and its lobe, will most readily collect sounds of considerable elevation and depression... *An ear of considerable breadth,* on the contrary, will most readily collect those sounds which in music we denominate flat; for there is nothing more certain, than that these differences of sounds depend on the different directions of the vibrations which cause them.—It is worthy of notice that these forms of the ear generally accompany corresponding forms of the organ of voice; and as such forms of the organ of voice always do produce elevated and depressed, or, on the contrary, flattened tones, the ear is thus admirably adapted to receive such sounds as the voice emits.

An ear which is unelaborate or presents rather one general concavity, than many well defined elevations and depressions, is rarely possessed of delicacy... *An ear presenting numerous elevations and depressions,* and finely elaborate, is always delicate—a circumstance which, like the preceding one, present their own explication.—The general rule, with regard to character, which may be drawn from this conformation, is, that persons thus destitute of musical ear, never possess sensibility of any species; they are consequently equally divested of all that ardour of mind which flows from such

sensibility; and, it is really true that philanthropy, benevolence &c. rarely distinguish them.

> The Man that hath no music in himself,
> Nor is not mov'd with concord of sweet sounds,
> Is fit for treason, stratagems and spoils;
> The motions of his spirit are dull as night,
> And his affections dark as Erebus:
> Let no such man be trusted.
>
> Merchant of Venice, Act. V. Scene I.

The magnitude of the nose, when the organ is, at the same time, well constructed, indicates the greater capability of the sense of smell. A nose which is very broad, and at the same time moderately elevated, is evidently an organ, by means of which the most extensive, and, consequently, the strongest impressions are received.—Hence, those possessing such a form of organ, are generally of firm and strenuous character. This is not to be wondered at, *since* man is the very creature of the impressions which he receives, and since all his most complex mental operations must depend upon the strength, weakness &c. of his individual sensations.

A nose which is very flat, is obviously rather adapted for heavier odours, which by its means will pass rather to the inferior than to the superior convoluted bones within the nasal cavity, and which form the proper organ of smell, as well as the superior.—Hence, as mental operation is throughout dependent upon sensation, the persons having such a form of organ, are generally of a character correspondingly depressed, or rather may be termed manageable as to character... *A nose which is very elevated,* or of that form called Roman, is evidently better adapted for the lighter and acuter odours, which will pass to the upper part of the organ of smell.—Hence, such persons are almost always more haughty and commanding in character.

A nose which is long, will more slowly transmit odours, which will, therefore, make a less powerful impression upon the proper organ of smell.—Hence, persons with long noses, are always slower and milder in their character... *A nose which is short*, and more especially turned up at the extremity, will more rapidly and acutely transmit impressions.—Hence, persons with such a nose, are always quick, pert and even impudent. The same is remarkable among quadrupeds: the pug dog, for instance, has such a form of nose, and precisely such moral habits. This form of nose is particularly unseemly, from its exposing those cavities of the organ, which modesty would conceal. Hence, persons possessing it, are not merely impudent, but often indelicate and filthy.

The tongue is the proper organ of taste; but as it is always concealed from our view by the lips, and as the lips—of all parts of the body possessing the most exquisite sense of touch, always bear an analogy in their form and delicacy to the tongue, we must examine the former in lieu of the latter.

The organs of these two senses (taste and touch), says Cuvier, are, indeed so much alike, that they may serve for the mutual explanation of each other. Recourse may be had to the organ of taste, in order to obtain an idea of parts which are not sufficiently developed for our observation in that of touch.

Large lips always indicate greater capacity with regard to taste.—Hence, in the negro, who excels in that sense, the lips are greatly developed, and the sensibility as to taste greater... *Narrow and linear lips* always indicate less capacity of taste, and less sensibility.—Hence, the persons possessing them, are always of very cold and formal character; they are often found to be penurious, unfeeling &c.

Lips with coarse, irregular and ill defined outline, always indicate a corresponding rudeness and vulgarity of character. *Lips with fine, regular, well defined outline,* on the contrary, always indicate a corresponding delicacy of character.

On the sense of touch, it is not necessary to dwell. *A finer organization of skin,* especially where it covers the tips of the fingers, always indicates a finer sense of touch and corresponding sensibility of character, and *vice versa.*

We have now only to consider the mouth and nose, as well as the prominences of the chin, cheeks and forehead, as constituting a portion of the organ of voice.

The great length and narrowness of the space between the nose and the chin, always indicates shrillness and acuteness of voice.—Hence the negro, who has this form of mouth, has a voice extremely acute; *because,* by this means, the palate is elevated, and the ellipsis of the jaws rendered narrow or acute.

The shortness and compressedness of this space, always indicates a voice which is correspondingly flat and compressed, arising from the opposite cause, namely, the flatness of the palate &c.

The width of the jaws always indicates a fuller voice, when they are not, at the same time, compressed, but are moderately capacious in height.

Thus, as the elevation or depression of the voice depends upon a corresponding closing of the glottis or flute part of the throat, so the fulness, or the poorness, or the flatness of

the voice, depends upon the form of the ellipsis of the jaws, which we have been just describing.'

'Another quality of the voice is indicated by the form of the only other parts of the face, which yet remain to be mentioned, namely, *the prominences of the cheeks, and those of the forehead immediately over the eyes.*'

This quality—*the resonance of the voice, is always in proportion to the elevation of these parts; for* the first mentioned prominences, contain cavities called the maxillary, and the latter, cavities called the frontal sinuses, in which this resonance actually takes place.

POSTSCRIPT.—In speaking of the peculiar situation of each organ of sense, it would perhaps have tended to the completion of the subject to have observed, that the proper organ of touch not being placed in the face, together with the other organs of sense, but at the tips of the fingers, is owing to this, that the organ of touch is neither, like the eye and ear, affected by media universally diffused, nor, like the nose and tongue, by objects which are easily transported to them, but by solids which are sometimes not easily moved, and sometimes require an organ of a certain length and flexibility, to come in contact with their various parts. Hence, it has the present situation. Moreover, even if solids had all been easily moveable, and readily applicable to a fixed organ, yet, as the hands must have been employed to move them thither, it was evidently, in many respects, most advantageous, that the organ of touch should reside in themselves; unnecessary movement is thus avoided, and the quickest and most accurate knowledge of objects acquired. It is for these reasons, then, that the organ of touch, instead of residing in the face, like those of the other senses, is borne about at the tips of the fingers.

PART FIFTH.

APPLICATION OF THE PRECEDING PRINCIPLES TO THE EXPRESSION OF THE PASSIONS.

In the production and conduct of the passions, there is a certain regular mechanism, which is susceptible of as accurate a disquisition, as the laws of motion, optics, hydrostatics, or any part of natural philosophy.

HUME'S ESSAYS.

IN PLACIDITY, no one muscle is brought into particular action: all are in a state of repose, without appearing relaxed or inert. There is, in the eye, a tranquillity void of languor, and the lips are in unconstrained contact.

As, in this case, no muscle is in action, no application of the preceding principles is required.

IN FRIENDLY GREETING and TACIT JOY, the angles of the mouth are very slightly drawn up, but never without other tokens of an incipient smile. The eye-brows are never drawn inward. Those parts alone act, which have immediate communication with the seventh pair or facial nerve.

As, in this case also, all the muscles employed are less actuated than in the following one, the application of the preceding principles to these actions will then be more properly introduced.

In LAUGHTER, all the effects produced by the former affection are greatly increased, and others are superadded. The whole countenance inclines forward, but without the attention being fixed upon any determinate object. The outward edges of the orbicular muscle of the eye are contracted, producing wrinkles and folds around the eyes. The lips are opened by the action of the same muscle: hence the teeth, particularly the upper, are made to appear; small wrinkles arise at the corners of the mouth; and the cheeks become fuller &c.—If an arch, or a wanton look be further added, the eye is turned sideways, and the upper eye-lid is contracted in the manner of a wink. . . With regard to the general figure, a lively contented laughter raises his head, and his breath is agitated. In the excess of the emotion, he places both his hands to his sides, as it were to support his body. At length, his legs begin to refuse their office; and, if the fit continued, he would fall to the ground. Tears also are shed when laughter advances to excess. Hence, says Shakespeare,

> 'More merry tears
> 'The passion of loud laughter never shed.'
>
> *Midsummer-Night Dream.*

In these motions, it is evident, that the attention not being fixed on any determinate object, is owing to the senses and the mind being already fully impressed; and the partial closure of the eye is to prevent such impression. The lips are opened, the cheeks elevated, and the teeth rendered apparent, in order to permit the rapid motion of the breath in respiration; and if the angles of the lips are especially elevated, that is owing to their connexion with the orbicular muscles of the

eye-lids, which are, at the same time, powerfully employed in closing these organs. The eye being turned sideways, and the upper eye-lid contracted into a wink, has an arch or wanton look, only because this deviation of a minute and particular part, from the general air of the countenance, indicates the existence of some minute and particular object, in the midst of the general emotion.

In SURPRISE OR WONDER, the eye-lid is opened, and the eye stands motionless in the socket, in consequence of the intercostal nerve being affected, and acting on the third pair. The same nerve, at the same time, acting upon the eighth pair, respiration is suspended, the free motion of the heart is impeded, and the mouth is opened, as the maxillary muscles, destined to that purpose, are affected; but as these act only on the lower maxilla, the teeth are not discovered. . . With regard to the general figure, the hands are extended, and more particularly the fingers, from the action of their muscular plexus.

Some of the circumstances, attending this emotion, have been beautifully painted by the most philosophical of all poets—Darwin.

> 'The virgin, Novelty, whose radiant train
> Soars o'er the clouds, or sinks beneath the main,
> With sweetly-mutable seductive charms,
> Thrills the young sense, the tender heart alarms.—
> Hence, in life's portico, starts young Surprise,
> With step retreating, and expanded eyes.—*Temple of Nature, Canto III.*

How admirable an opportunity for the display of this feeling, has Congreve given in the following passage.

> 'Let me not stir, nor breathe, lest I dissolve
> That tender, lovely form, of painted air,
> So like Almeria. Ha! it sinks, it falls;
> I'll catch it ere it goes, and grasp her shade,
> 'Tis life, 'tis warm! 'tis she! 'tis she herself!
> It is Almeria! 'tis, it is my wife.
>
> *Mourning Bride, Act II. Scene II.*

In these motions, the eye-lids are expanded and the eye is fixed, solely in order to receive a more complete impression from the object. The mouth is opened and the fingers are expanded, entirely by that association which, when one organ of sense is thus expanded for action, prompt us equally to prepare the rest. The suspension of respiration and of the motion of the heart, is owing to this, that the excessive employment of any one system, as the intellectual, must always be at the expence of another—the mechanical or vital.

In Contempt, the eyes are drawn sideways, the external muscle of one, and the internal muscle of the other, acting together. The eye-brows are drawn inward and downward; the mouth is firmly closed; but as the lower lip rises in the middle, it becomes arched, and this is effected by the agency of the fifth pair of nerves. When the head turns towards the right, and the eyes towards the left hand, the passion is rendered more expressive.

These motions are all explicable, on the principle that, while the organs of sense are all turned toward the object, in order clearly to indicate or point it out, yet, in as much as is consistent with this indication, they are all firmly closed, and the head is even somewhat turned away, in order to express aversion. The closure of the organs in this case, and their opening in wonder, have thus precisely opposite causes.

In Anger, the action of the muscles draw the eyes wide open; the eye-brows descend; the teeth are violently compressed together; and the face is convulsed in a thousand forms... With regard to the general figure, a person in the impetus of rage, beats with hands and feet, and stamps till the ground shakes under him.

Here the eyes are opened as in wonder, in order to receive a more complete impression from the object; but the eyebrows are not, as in wonder, elevated, because there is not

here, as in it, that ignorance of the object inspected, but, on the contrary, a discrimination which requires their descent. The convulsion of the features, compression of the teeth, and excess of muscular action in general, is ascribable to that universal preparation to act, which anger was intended by nature to bestow.

In SORROW, the mouth is drawn downward by the descent of the upper lip; the fifth pair of nerves being those principally affected... With regard to the general figure, an oppressed, sorrowful and melancholy person lets his head sink downward, or he supports it with his hand, the equipoise is no longer maintained by the muscles of the neck, that is, the nerves belonging to those muscles are rendered inert... When DESPAIR is added to this emotion, the face is directed upward, and somewhat obliquely; the brow is furrowed with wrinkles; and the middle of the eye-brow is drawn upward.

Limited as is Collins' description of despair, from its application to music, it is yet expressed with great felicity, and extremely beautiful.

> 'With woeful measures wan, despair,
> Low, sullen sounds, his grief beguil'd,
> A solemn, strange and mingled air,
> 'Twas sad by fits, by starts 'twas wild.'—*Ode on the Passions.*

Here every thing indicates that general relaxation of the muscular system which sorrow produces; and even when despair is superadded, the only action performed, are those which direct the eyes toward heaven, and supplicate aid from above. But even in this case, the eye-brow is elevated, and the brow wrinkled, in order to look upward with as little exertion as possible; hence they strongly mark that imbecility which enters into the nature of despair. The oblique direction of the face has the same object, and the same effect.

In WEEPING, the corners of the mouth are drawn downward, and the lower part of the nose upward; the eye-brows descend; the eyes are nearly closed; and tears are pressed out of the lacrymal glands. In this case, all the muscles which receive the fifth pair of nerves, act in a very forcible manner.

Here the eye-brows descend, and the eyes are entirely closed, in order to compress the lacrymal gland and express the tears; the corners of the mouth are drawn down, in order to depress also the lower eye-lid, and permit the tears to flow; and the lower part of the nose is drawn up, so as to widen the nostrils, with precisely a similar view.

In DYING, it is to be observed, first, that the eyes are drawn toward each other by the influence of the pathetic nerves. Secondly, that the mouth is opened, and the chin elongated by all the muscles of the neck. And, thirdly, that all the other muscles cease to act.

Here the desire of respiration induces the opening of the mouth; the eyes are turned toward each other, in consequence of the internal suffering; and the other muscles cease to act, from the exhaustion of muscular power in general.

APPENDIX No. I.

ANATOMICAL FACTS SUPPORTING THE DOCTRINE FROM WHICH THIS REFERENCE IS MADE. THESE FACTS ARE CHIEFLY COLLECTED FROM AUTHORS WHO SEEM TO HAVE HAD NO PARTICULAR THEORY IN VIEW, AND WHO, IN STATING THEM, ARE THEREFORE THE LESS LIKELY TO HAVE BEEN MISLED BY ANY IMPROPER BIAS *.

MONGOLIC VARIETY.

Organ of Sense.

In the negro, the cranium remaining the same, the area of the section of the face is, according to Cuvier, encreased about one fifth. In the Calmuc, it encreases only one tenth: in northern nations *the face is therefore comparatively small.*

'The nearer the Tartars are to the pole,' says Smith, 'the *smaller* are their *eyes,* and the *shorter* their *nose.*'

The *ossa nasi* and aperture of the *nostrils,* are small in the head of a Calmuc in possession of Blumenbach.

* If these facts, as now arranged, tend to establish a general theory, it will afford another proof of the great value of arrangement in science.

The dorsum of the *nose* is also *narrow* in the head of a Kirgisian Cossack, in Blumenbach's possession.

The *orbits* of Russians are, according to Soemmerring and others, *contracted;* the *teeth* are *small;* and the horizontal part of the *palate-bone narrow*. This last occurs also in the Kirgisian Cossack.

In a communication to Dr George Foster, Professor Camper ascribes the confused arrangement of the teeth, which is frequent in all the northern tribes of mankind, to the *smallness* of the space comprised between the canine teeth of the lower jaw. These seem to displace the incisors; for *the jaw-bones are not only narrower in the inhabitants of the northern, than in the natives of the southern hemisphere, but appear of very inconsiderable breadth, when contrasted with those of an African or Asiatic.*

Cerebrum.

The cerebral cavity of northern nations is, according to Professor Camper's observations, broader, but less elevated, than that of the Æthiopic ones.

Cerebellum.

The *cerebellic cavity* of these people is large, and their occipital foramen small.

Blumenbach describes the *occiput* of a North American to be *larger*, not merely than that of the negro, but than that of the European; and the cranium to be, in almost all respects, the reverse of the negro's.

The *occiput* of a Tunguse is, according to the same author, 'mirum in modum *retro eminens*, ita ut protuberantiæ occi-

pitalis externæ distantia a dentibus incisoribus superioribus 9 pollices Lond. æquaret.'

ÆTHIOPIC VARIETY*.

Organs of Sense.

The head of the negro is, according to Soemmerring, larger in proportion to his body than that of the European; but *his face is larger in proportion to his calvarium.*

The jaw-bones, and *the cavities which contribute to form and to protect the organs of sense,* (whether considered absolutely, or with a reference to the rest of the head), are, according to the same anatomist, constructed *on a larger scale in the negro;* and are probably better adapted to their office, than in those tribes of mankind, in whom a superior understanding suplies the place of mere animal accomplishments.

The *aveolar processes* of the upper jaw are considerably *protuberant,* and form a characteristic trait in the Negro's physiognomy.

The *lower jaw,* which is *broad, thick* and less uniform on its surface, is shortened at the sides and extremity. The angle of the jaw, which in us is generally obtuse, approaches nearer to a right angle: that *part of it* which is covered by the masseter, being *unusually broad* in the negro, as well as in the ape.

* Wherever no name is attached to any of the following statements, Soemmerring is, in general, the author of the observation. The facts derived from him are numerous and important. *From so many facts, it is certainly strange that he himself should have drawn no great conclusion.*

The *teeth* are generally sound, and compose a very compact row. They are *broad, thick* and *long;* more especially the canine teeth.

The *roof of the negro's mouth,* which is perhaps *wider,* is evidently of *greater length,* and is *sculptured with deeper inequalities* than that of the European.

The *tongue,* as might be expected from the parieties that enclose it, is *larger* in the negro than in the European.

The *nostrils* are *wide.*

When the head is seen in front, the *cavity of the nose* appears uncommonly *large.* In Europeans, under similar circumstances, I have been unable to discover so wide a portal to the organ of smell, or a cavity so extensive within.

The *choana,* or passage by which the nose and mouth communicate, is *of a size equally remarkable* with the external aperture of the nose.

That nature intended him to possess *a more exquisite sense of smell* than his European brethren, is *evident from the size and configuration of the ossa turbinata superiora.* The middle pair of these fine convoluted bones forms on each side of the nose pretty large globular protuberances, which must considerably extend the surface of the olfactory membrane.

In one of Soemmerring's negro specimens, the cribriform plate of the ethmoid bone occupies a prodigious space in the base of the skull.

Haller remarks that negroes in the Antilles, can distinguish by scent, the foot-step of a negro from that of a Frenchman.

The *orbit* is, according to Soemmerring, *deeper;* the line described by its *margin* is *of greater length;* and the *eye itself* is probably *larger* in the negro than in the European.

In the negro, the aperture of the eye-lids is smaller than in the European, and of course less of the eye is visible. The *eye-ball* is perhaps *larger.*

Dr Walter thinks that the *retina* is *of a more robust texture* than in Europeans.

The *Ear* is of a more circular shape than in Europeans; and resembles somewhat more closely, the same organ in apes. It seems frequently to *project farther than usual from the head.* It is a well known fact, that savages can *move their ears* at pleasure, and *possess the sense of hearing in great perfection.*

The *meatus auditorius externus* is *wider*, although the whole os temporis is less than in Europeans.

The nerves on the basis of the brain, in comparison with those of Europeans, under like conditions, appear somewhat thicker. This difference, which is most striking in the olfactory, optic and fifth pairs, might be presumed from analogy. For, if the eye, ear and organ of smell be larger, as has been stated, we must expect that the nerves which supply these organs will have correspondent magnitude.

Cerebrum.

The cerebral cavity of the Æthiop is, according to Mr Walker's observations, more elevated, and, according to Camper's, at the same time, narrower, than that of the Mongol.

The *negro skull*, viewed in front, appears to be compressed at the sides, especially at the upper part; its cavity seems to be *straiter;* and the parietal bones smaller in every dimension, than in European skulls.

The cavities for the middle lobes are very contracted as to length, in a negro cranium in my possession.

The impression left by the attachment of the upper margin of the temporal muscle, extending from the os frontis over nearly the whole of the os parietale, is deeper, and as-

cends nearer to the sagittal suture in the negro than in the European.

The extraordinary height and circumference of the zygomatic arch can leave little doubt that the bulk of the temporal muscle is likewise very considerable. On this cause depends the protuberance of the cheek-bones, which are uncommonly large, and nearly quandrangular.

None of the muscles of the face, except the masseters, and those of the external ear are uncommonly large.

Soemmerring found the length of a cord passed from the root of the nose, over the middle of the os frontis, and along the sagittal suture to the middle of the posterior margin of the os occipitis, to be less in the negro than in the European. *The vertical arch* is, therefore, *smaller*. In selecting the specimens to be compared, care was taken that the bones of the face were of equal length *.

The *circumference* of the negro skull, ascertained by a cord passing horizontally over the eye-brow and the upper margin of the os temporis, is considerably *less*.

Neither the largest diameter of the skull, from the os frontis to the os occipitis; *nor any smaller diameter*, from one os parietale, or os temporum, to the other, *attain the size they possess in the European.*

The *principal bones* which form the cavity of the cranium are *collectively smaller*. The os frontis, ossa parietalia and os sphenoides appear smaller; although the *ossa petrosa* and the *os ethmoides* seem *larger*.

These bones possess a hard, compact and brittle texture, like those of quadrupeds.

* They should have been of greater length in the negro heads selected by Soemmerring; for in them it is the tendency of these bones to exceed, in proportional magnitude, all the other parts. The negro heads, in which the bones of the face were no longer than those of Europeans, must have been diminutive; and the vertical arch of their calvarium is thus rendered much too small.

From the preceding remarks, we may infer, that in the negro, *the size of this cavity bears a smaller proportion to the face and organs of sense, than it does in the European.*

It must, however, be allowed, that (*all things considered*) the cavity of the negro's skull somewhat exceeds in height that of the European.

Dr Walter, like his predecessor Dr Meckel, observes that the medullary substance of the brain of a negro he dissected, was of a firmer texture than usual; and possessed that degree of elasticity which sometimes occurs in the brain of lunatics.

Cerebellum.

Professor Lichtenberg has observed that in the negro (as if a portion of the hind part of the skull were removed) *the depression between the head and shoulders is much less considerable*—a conformation exhibited by animals of the ape tribe in a still more remarkable degree.

When the cavity of the European and Æthiopic cranium is of equal length, Mr Walker has found that the cerebellic cavity of the Æthiopic, measured between the posterior clinoid process and the inside of the spine dividing the cavity posteriorly, is shortest; but it does not seem to be proportionally narrower.

The Mallikolenses have also, according to Forsters, a compressed occiput.

The *occipital foramen* of the negro is, according to Soemmerring, *larger.*

In the negro, the *foramen magnum* appears to lie *not quite so forward* as in us.

This may be the reason why a negro's skull, after the maxilla inferior is removed, being laid on a table, falls back-

ward, so that the teeth do not touch, but are suspended at the distance of more than a line above the surface of the table.

The skulls of Europeans of mature age, usually incline forward, and rest with equal ease on the teeth, or on the os occipitis. All negro skulls, however, do not possess the property described.

GENERAL OBSERVATIONS.

I have thought it unnecessary here to introduce details respecting the Caucasian variety, as we know it is, throughout, intermediate to the other two.

Thus, briefly to recapitulate: the organs of sense are small in the Mongol; intermediate in the European; and large in the Æthiop.

The cerebral cavity of the European cranium is, upon the whole, the largest; that of the Mongolic and Æthiopic less.

In Camper's unpublished commentaries on Osteology, the breadth of the head is said to be greatest in the (northern) Asiatic (or Mongol), of middle size in the European, and least in the African.

The cavity of the Mongolic cerebral cavity is, however, as far as Mr Walker has been able to observe, the shallowest; that of the European, intermediate; and that of the Æthiop, and even of the Indian, deepest.

The cerebellum is large in the Mongol; intermediate in the European; and small in the Æthiop.

APPENDIX No. II.

FACTS WITH REGARD TO THE INTELLECTUAL ENERGY OF THE THREE GREAT VARIETIES OF THE HUMAN RACE, PRECISELY CORRESPONDING WITH THE RELATIVE CAPACITY OF THEIR SENSITIVE, PERCEPTIVE AND VOLUNTARY ORGANS NOW DESCRIBED, AND THEREFORE CONFIRMING THE THEORY FROM WHICH THE REFERENCE IS MADE *.

MONGOLIC VARIETY.

COLD, by preventing the moisture of perspiration, and by corrugating the skin so as to cover the extremities of the cutaneous nerves, blunts the sense of feeling and tends greatly to diminish the sensibility of the system. Hence the inhabitants of cold countries are little subject to strong passions.

* The following observations are generally from Falconer. They also coincide with general opinion on these subjects; and render particular references unnecessary.

Love, as a passion, is scarcely seen in a northern country. As a proof of this, jealousy, its inseparable attendant, when the former exists in a high degree, is hardly found; and generally, when it does appear, is made an object of ridicule.

Remembrance of injuries, as Tacitus remarks, does not, among them, continue so long, nor are they so vindictive as the southern people.

This diminished sensibility accords with the less developement of the organs of sense in these people.

Benevolence and kindness of disposition nevertheless exists among the natives of cold climates. Though less readily affected than southern nations, their impressions are more permanent and attended with greater effect.

The inhabitants of cold countries are more fixed and steady in their resolutions, than those of hot. The impulse must, indeed, be strong to produce any effect; but when the impression is once made, it engrosses the attention in a great measure, and is not liable to be effaced by subsequent ones.

The diminution of sensibility contributes to make the people who live in cold countries less timid. Slight impressions scarcely affect them; and the motives that would deter an inhabitant of a hot country from an enterprise, never reach the sensation of one of a cold climate. This resolution of the northern nations in despising the fear of death, was remarked by several ancient writers, and particularly by Lucan.

This greater permanence and strength, though less elevation, of mind than that of the natives of southern regions, very curiously accords with the greater breadth and consequently strength, though less height, of the cerebrum than that of these people.

Cold climates are averse to indolence, at least of the body, and produce a habit of exertion and activity. Repose

and shade are the securities from heat; fire and exercise, the remedies of cold: so that the necessities of the climate itself contribute to form the character of the people.

This greater energy of voluntary action perfectly accords with the increased developement of its organ—the cerebellum, in these people.

In short, all the habits of the Mongolic Variety (described in this Appendix) agree with the anatomical structure of the face, cerebral and cerebellic cavities (described in the first Appendix); and afford the strongest confirmation of the theory which has been delivered in the Third Part of this Treatise.

ÆTHIOPIC VARIETY.

Heat being the most universal stimulant, by keeping the skin smooth, void of corrugation and moist from perspiration, exposes the extremities of all the nerves, and encreases the faculty or power, as well as the accuracy of sensation or feeling.

The passionate temper of these people, observed from earliest antiquity, and mentioned by Hippocrates, arises from the sensibility thus induced. This is observable even among the Italians in Europe, and among West Indians descended of European parents.

The amorous disposition of the people of hot climates is owing to the same sensibility; but although the enthusiasm of love be most powerful in such climates, yet this passion is in them far from being of a refined nature in point of sentiment.

The vindictive disposition of these people is proved by the cruel revenges, by the dagger, or by poison, so frequent in hot climates, and mentioned even in the Cyropædia of Xenophon, together with the inhuman treatment of prisoners which prevails among them.

This increased sensibility accords with the greater developement of the organs of sense in these people.

The levity or inconstancy of mind so remarkable in warm climates is dependent on the same sensibility. The mind is there open to every impulse; but as these succeed one another rapidly, none of them make any very permanent impression, but efface one another in succession.

The sensation of weakness also discourages all exertion of body or mind, by suggesting the idea of inability; and this idea, joined with a sensibility which the weakness contributes to heighten, produces that timidity of character, for which, as Machiavelli observes, the people of hot climates are remarkable.

The elevated conceptions, warmth of imagination, splendid imagery, mythological fables and metaphoric or bombastic language which distinguish these people, result from the same cause.

This greater elevation and weakness, though less permanence and strength, of mind than that of the inhabitants of cold climates, very curiously accords with the greater height, though less breadth, of the cerebrum than in these people.

Indolence is a striking characteristic of the natives of hot climates; seemingly interwoven into their very constitutions. In many places, as Dampier and others have observed, they let their nails grow into claws, that all men may see they do not work. Ease with them is the greatest good, and nothing surprises them so much as to see Europeans take

pleasure in exercise: they are astonished to see people walk, who have the choice of sitting still.

Even the East Indians, who make but a gentle approach to the Africans, believe that repose and non-existence are the origin of all things, and the end in which they terminate. They, therefore, consider the state of mere inaction as the most perfect of any, and as the object of their wishes. They give to their supreme being the title of *immoveable*. The inhabitants of Siam believe that their happiness consists in not being obliged to animate a machine, and to give motion to the body.

This less energy of voluntary action perfectly accords with the less developement of its organ—the cerebellum, in these people.

In short, all the habits of the Aethiopic variety (described in this appendix) agree with the anatomical structure of the face, cerebral and cerebellic cavities (described in the first appendix); and also afford the strongest confirmation of the theory which has been delivered in the Third Part of this Treatise.

CAUCASIAN VARIETY.

The natives of moderate climates possess a middle degree of sensibility between those of cold and those of hot ones.

The temper also of the people of moderate climates, is of a middle nature, between the fiery passion of the south, and the coldness and patience of the north.

Love appears to the greatest perfection in moderate climates. Combined with a moderate degree of sensibility, and with esteem and attachment, arising from superiority of

intellect, it is free from that debasement, which must necessarily attend the union of the sexes, where the passions are omnipotent, and equally free from that which attends their being made a matter of mere convenience.

This moderate sensibility perfectly accords with the moderate developement of these organs in this variety.

Friendship is seen to most advantage in temperate climates. In great degrees of heat, the mind is enfeebled, and the disposition becomes timid, variable and selfish, and, of course, unfit for the reception of a passion, to which fortitude, constancy and self-denial are so necessary; and, in very cold countries, the affections are too insensible and too indifferent, to arrive at that pitch of attachment which merits the name of friendship.

A proper medium, also, between severity and too great forbearance, is most found in temperate climates.

Of the intellectual faculties, even Galen has remarked the great superiority in the inhabitants of the temperate zone, over those both of the torrid and frigid. Aristotle also observes, that extremes of temperature are unfavourable to the powers of the mind. All history confirms its truth.

The people of moderate climates, though inferior in passive courage to those of cold, are, from superiority of intellect, more able to take advantage of their success. Hence, Vegetius recommends the choice of soldiers from temperate climates, from their possessing both active courage, and the understanding necessary to improve advantages.

This superiority of intellect perfectly accords with the great capacity of the cerebral cavity in these people.

The degree of activity of the inhabitants of moderate climates, though not less than that of those who inhabit the most frozen regions, where indeed all the faculties are be-

numbed, is less than that of the inhabitants of cold climes in general, and greater than that of the inhabitants of hot regions.

This moderate voluntary action perfectly accords with the moderate capacity of the cerebellic cavity.

In short all the habits of Caucasian variety (described in this appendix) agree with the anatomical structure of the face, cerebrum and cerebellum (described in the first appendix); and likewise afford the strongest confirmation of the theory delivered in the Third Part of this Treatise.

APPENDIX No. III.

AN ACCOUNT OF THE DOCTRINE OF GALL.

The doctrine of Gall may be reduced to the seven following heads.

1. Men, like animals, have innate dispositions and propensities.
2. There has been bestowed upon them, for these purposes, certain organs, as innate instruments, by means of which they have relations with the exterior world.
3. These organs have their seat in the brain, which, however, cannot be considered as a power, but only as a material condition.
4. It is not to be supposed, that the brain is to be considered as one organ, and this the general organ of animal life: it is merely the assemblage of particular organs; since every innate disposition has its peculiar organ, which is

more strongly developed, according to the force of the disposition.

5. These organs are manifested on the surface of the brain, and form
6. Certain eminences upon the exterior skull. Whence
7. We may recognise their presence under certain conditions and restrictions. And hence originates the science of *Craniology* and *Cranioscopy*.

Gall points out the seat of 26 organs, which he classes, as follows.

1. *Those by which man is able to enter into immediate connection with the external world.*

This class contains 11 organs. It must be premised, that most of these organs are double; except some, which meeting in the centre, appear single on the skull.

See Plate VI. Fig. 1 and 2, where these and the other organs are marked.

1. Organ of Sexual Love.
2. Organ of Parental Affection.
3. Organ of Friendship and Fidelity.
4. Organ of Fighting.
5. Organ of Slaughter.
6. Organ of Address.
7. Organ of Cupidity.
8. Organ of Good Nature.
9. Organ of Imitation.
10. Organ of Vain Glory.
11. Organ of Constancy and Firmness.

2. *Those organs by which we are enabled to acquire a more familiar acquaintance with objects that are known to us by the external senses.*

12. Organ of aptness to Learn.
13. Organ of aptness to Learn and Retain Places.
14. Organ of aptness to Recollect Persons.
15. Organ of the sense of Colours.
16. Organ of aptness in Music.
17. Organ of aptness to Learn Numbers.
18. Organ of aptness to Retain Words.
19. Organ of aptness to Retain Language.
20. Organ of Mechanic Art.
21. Organ of Prudence or Circumspection.
22. Organ of Loftiness.

3. *Those organs which raise us above the brutes.*

23. Organ of Rhetorical Acuteness.
24. Organ of Metaphysical Subtlety.
25. Organ of Wit.
26. Organ of Theosophy.

With regard to the doctrine of Gall, I have already remarked, that the minute details of physiognomy are not to be found in any investigation, either of the superior, or posterior part of the head, as he has absurdly attempted. The reasons of this were obvious. First, the superior and posterior part of the head presents only one or two organs uni-

formly constructed, except with regard to the great and more general deviations which have already been explained; and, consequently, no minute forms are to be discerned on them, superficially examined. Secondly, the whole superficies of these organs is covered by the skull, somewhat irregular in its thickness, so as to render it difficult to calculate what may be the minute conformation of the subjacent parts. Thirdly, the skull, covering these organs, is itself covered with hair, so that any examination of them is thus rendered still more difficult. Fourthly, the dress of most nations presents an additional obstacle.

While, then, the upper and back part of the head presents only two great organs which are liable to no other differences of appearance than the general and simple ones already described, Gall has throughout egregiously erred, in assigning a multitude of *simple and distinct organs*, for *functions which owe their existence to a combination of others.*

Moreover, in the very arrangement of these *simple* organs of *compound* functions! Gall has even multiplied error in the most whimsical and ridiculous manner. Thus, he has placed the organ of *Theosophy* (No. 26.) not only near to, but in actual contact with, the organ of *Mimickry* (No 9). Now, it is evident, that if one of these organs be very high, the other cannot be very low; for such sudden transitions exist not on the surface of the skull. Hence, if the organ of *Theosophy* be very high, the organ of *Mimickry* cannot be very low; and as energy of function is inseparable from healthy magnitude of organ, it, therefore, remains for Dr Gall to prove what connexion there can possibly be between *fun* and *the knowledge of God!* But perhaps the Doctor has invented a new system of Religion as well as of Physiognomy, in which the two circumstances may fall into very appropriate contact . . . The organ of *Music*, too, (No. 16.) is in contact with the organ of *Theft* (No. 7.);

and as in the case of the one being very high, the other cannot be very low, it follows, not only that the greater thief a man is, the more likely he is to be a musician! but that the greater musician a man is, the more likely he is to be a thief! A pleasant reflexion, truly, for the amateurs of music? Beware, my friends, how, in future concertos, you exhibit yourselves as the now avowed friends of theft and harmony.—With regard to the ladies, they may perhaps be permitted to escape on the principle, that excellence in this—the most charming of all the fine arts, has no small connexion with the stealing, at least, of hearts. But, as to composers, the Doctor doubtless thought, that musical composition and plagiarism being often—very often connected, he could not go far wrong in placing their organs side by side.

But to lay aside merriment, for which it is to be regretted that Gall should have given any scope, it is not to be denied that he is entitled to high praise for the perseverance and genius he has employed on this important subject; and it is only to be deplored that he has not sufficiently employed scientific principles, or shunned empirical methods.

In order, however, to ascertain the frequent existence of any passion, or habit of mind, *the search for minute and distinct organs must be abandoned;* but, in order to effect the purpose, it is only necessary to ascertain the existence of the signs of those degrees of the simple powers, which are requisite to constitute the passion or habit, than which, according to the preceding principles, nothing is more easy.

APPENDIX No. IV.

SOME REMARKS ON THE DOCTRINE OF LAVATER.

It is perhaps true, that a more virtuous, and a more amiable being than Lavater never existed, and there certainly was no victim of the French Revolution more to be deplored than that excellent man.

The only good effect which the French Revolution has produced, namely, that of forcing several of the Governments of Europe to reward talents and merit, which can alone successfully oppose a despotism like that of France—this only good effect has been awfully counterbalanced by the destruction of so many great philosophers and excellent men, and by none more than that of this philanthropist. The advocates of that revolution may, perhaps, conceive that the loss of a few priests, like him, is a matter of little import. And, indeed, had the pastor of Zurich borne any resemblance to the dissipated clergy of France—had he, for instance, had the slightest mental affinity to their favourites—the petty intriguing Sieyes, or the unprincipled Talleyrand,

equally the friends of liberty or of despotism, as their own interests are consulted, or to the apostate Maury, who could abandon the cause of a mild legitimate monarch, for that of an unfeeling and ruffian usurper, I should not have regretted his fate.

Although, however, by the keenest sensibility and the most exquisite taste, he was eminently qualified for physiognomical observation, yet his excessive enthusiasm utterly impeded its steady and regular progress as a science: its statements were tolerable only when delivered in the glowing diction of Lavater; and, when expressed in more common language, had the air not only of extravagance but of absurdity.

From want also of the power of generalizing in a great and extensive manner, he was incapable of arranging his own observations, and consequently could deduce from them no general conclusion.

The absence, moreover, of all anatomical and physiological knowledge—a circumstance, which it is but justice to say, that he himself was among the first to acknowledge and regret—this held him ignorant of the causes of all the motions he observed, and rendered impossible the establishment of general principles and the attainment of definite objects.

With knowledge, however, of that kind, the man of taste will ever rise eminently benefited from the perusal of his "Fragments", which, though Gall and others have had the hasty presumption utterly to condemn them, yet as the first important work on a previously neglected science, I will venture to say, they have perhaps, in value, no parallel in the history of literature.

POSTSCRIPT.

In the Third Part, (page 40) it was proposed to arrange the human race into three varieties, founded at once upon physical form and moral habit—the physical form of three different organs, viz. those of sense, the cerebrum and the cerebellum, and the consequent energy of the sensitive, perceptive and voluntary powers, exercised by these organs. . . . That form and this energy, was proposed as the basis of all such classification, in lieu of the merely physical, and these, too, insulated bases of Camper, Blumenbach and others; and whether it led to the adoption of three, or five, or any greater number of varieties, was stated to be immaterial. The *nature* of the basis was that for which alone we contended.

When these observations were made, it would perhaps have been right to have explained why, though we were to arrive at the same conclusion, with either Camper or Blumenbach, as to the number of these varieties, it was, nevertheless, necessary utterly to reject their bases or principles,

to form new ones, and to draw independent conclusions, whether they coincided with theirs or not.

Now the fact is, that the bases or principles of classification, delivered by these physiologists, are imperfect and erroneous, even physically considered. The relative magnitude of the cerebellum is utterly neglected by Camper; and the relative magnitude neither of the organs of sense nor of the cerebellum can be correctly ascertained by the Vertical Rule of Blumenbach. If, then, by the principles of the one, a third of the intellectual organs—those of sense, are excluded, and by those of the other, two-thirds, viz. both organs of sense and cerebellum are placed nearly in the same situation, it incontestibly follows, that the principles adopted by both are defective, and that the conclusions drawn from them must be erroneous, even in a physical point of view. But as we have succeeded in proving, not only that one or other of the three great intellectual organs, but also that one or other of their functions excels respectively in the Mongol, the European or the Æthiop, it irresistibly follows, that Camper and Blumenbach have neglected moral or mental principles, as well as physical ones, and of no less importance than they.

Thus the classification here established differs from theirs, both as to physical character and moral result; and is attended with advantages of which they could form not the slightest conception.

It is here only necessary further to remark, that, than this difference of the physical character of the head and the powers of the mind dependent upon it, no nobler basis could be adopted for the arrangement of Natural History in general.

C. Stewart, Printer, Edinburgh.

Fig. I.

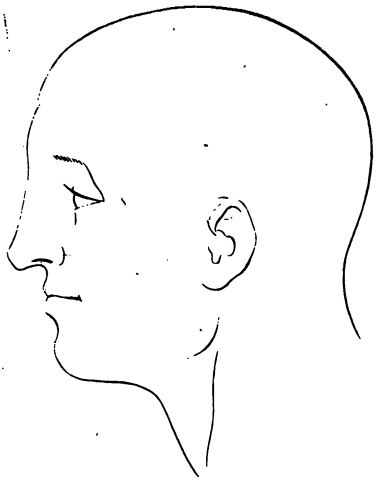
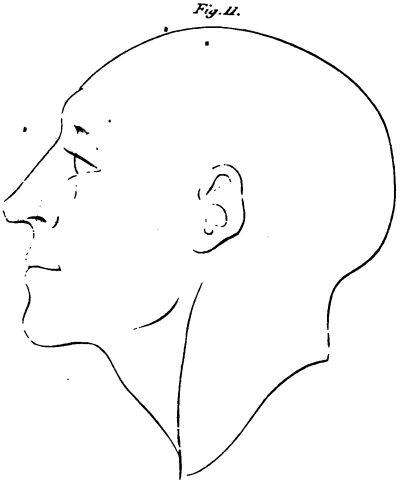


Fig. II.



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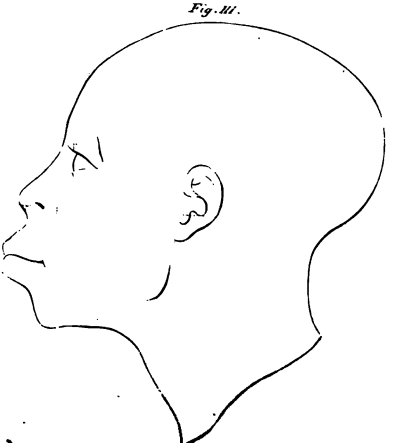

Fig. 1

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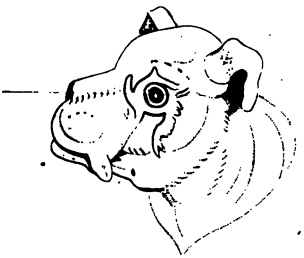

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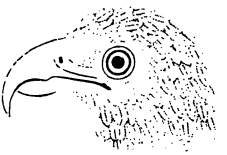

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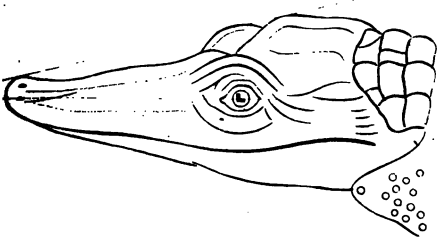

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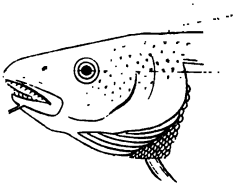
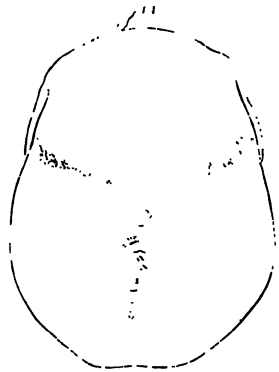


Fig 1

Tungusse
of the 1st or Mongolic Variety

2

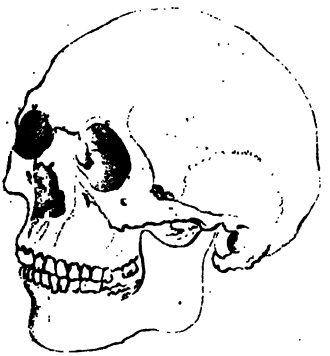


Georgian Female
of the 3rd or Caucasian Variety

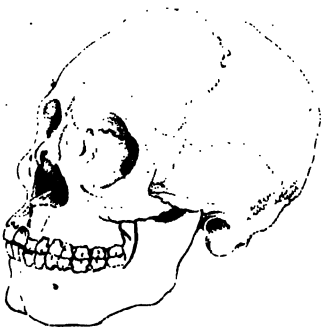
3

Guanean Female
of the 5th or Ethiopic Variety

Fig. 1.



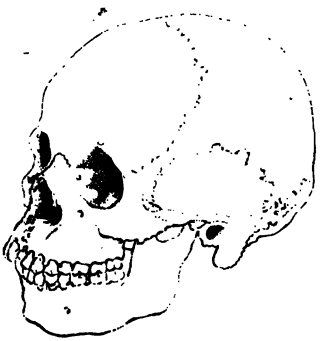
Tunguse
of the 1st or Mongolic Variety



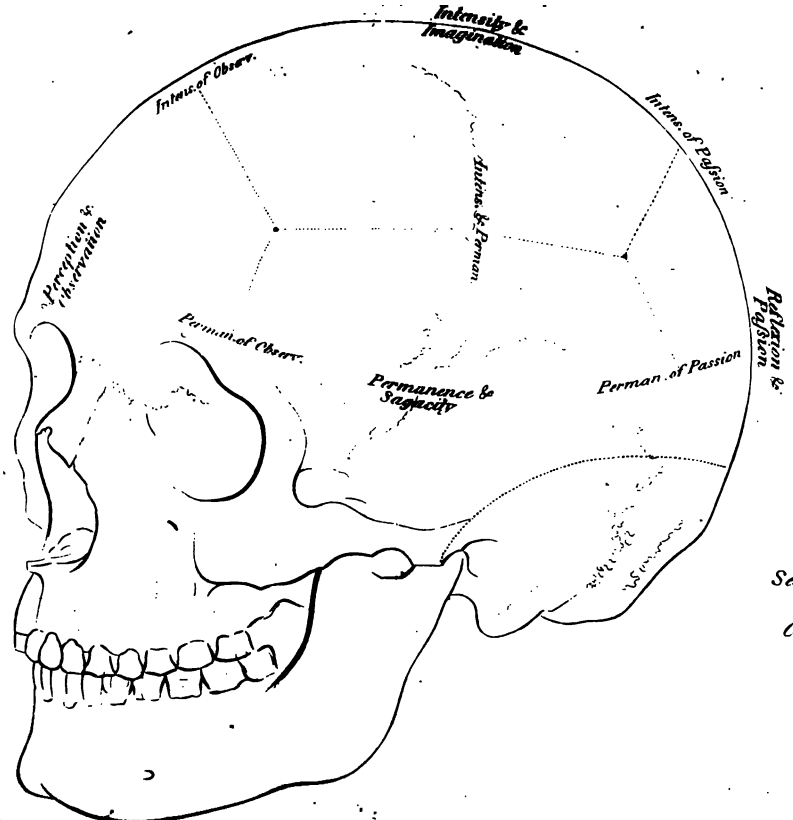
Caribean
of the 2d or American Variety

Georgian Female
of the 3d or Caucasian Variety

Otaheitian
of the 4th or Malaiac Variety.



Guinean Female
of the 5th or Ethiopic Variety.



Seat of the Eye &c
or
Organs of Sensation

Seat of the Cerebellum
or
Organ of Volition.

[illegible]

Fig. 1

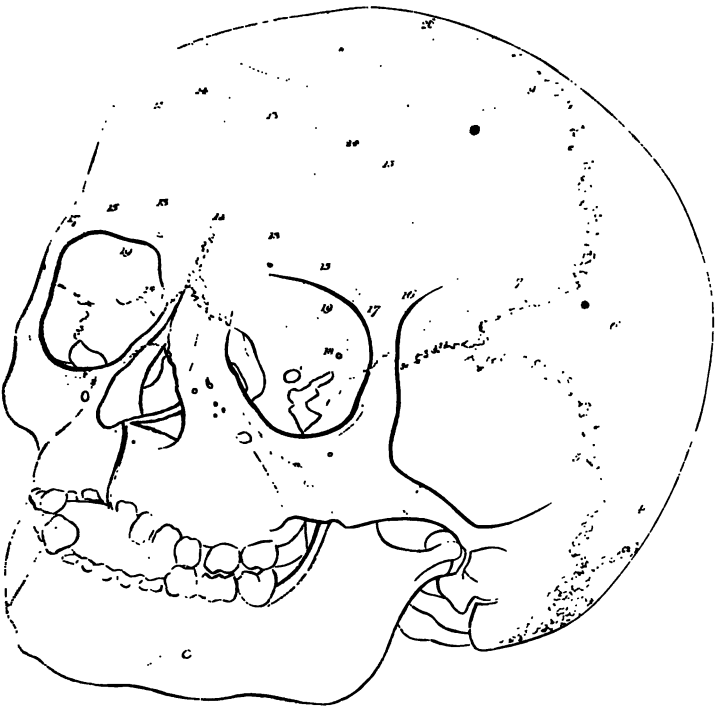


Fig 2.

POPULAR OBSERVATIONS

ON THE

DISEASES

OF

LITERARY AND SEDENTARY PERSONS.

POPULAR OBSERVATIONS

ON THE

DISEASES

OF

LITERARY AND SEDENTARY PERSONS.

TO WHICH ARE ADDED,

HINTS

FOR

THEIR PREVENTION AND REMOVAL.

By W. ANDRE PEARKES,

MEMBER OF THE ROYAL COLLEGE OF SURGEONS.

Non est vivere, sed valere vita.—MARTIAL.

LONDON:

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1819.

PREFACE.

AS precepts for the preservation of the health of *others* have in all ages employed the pens of our most celebrated writers, it appears somewhat extraordinary that so little should have been put forth in connection with those diseases of which they are *themselves* so peculiarly the victims. To supply this deficiency is the object of the present undertaking; in the course of which the author has endeavoured to point out, in a familiar manner, divested as much as possible of all scientific technicalities, which tend but too often to bewilder the general reader, the innumerable maladies by which

liable, as will appear in the sequel. Plutarch goes still further, and observes, that they should not only subject themselves to medical precepts, but that they should even study them, and laments that any should sacrifice their lives in, oftentimes, useless study, whilst they neglect the art of preserving health.

The ordinary diseases to which sedentary men are subject arise principally from two causes—the too great exertion of the mind, and a want of necessary exercise ; for the proof of which we need not look further than to the effects produced by them.

Metaphysics teaches us the influence exercised by the mind over the body, and the body over the mind ; but in medicine, though its object may not be so vast, we perhaps go on more certain grounds: without looking to the primary causes of this reciprocal action, we are content to watch

the phenomena resulting from them. Experience also proves that a certain state of the body produces a certain action on the mind, and *vice versa*. The union of the mind and body is so strong, that we cannot suppose the one to act without producing some effect on the other; the sensations being communicated to the body through the medium of the brain.—Whilst the mind is occupied, the different blood-vessels of the brain are in a state of greater or less activity, and consequently are more or less excited, which tends to fatigue it. The mind, indeed, is as susceptible of fatigue, after intense study, as a man of robust constitution is after long continued bodily exertion. Of this fact there are doubtless many convinced from their own experience, who have been affected with head-ache after too severe and long-continued an application to any particular object. An observation of any one

deeply engaged will show, that not only are the eyes affected, but that the muscles of the face appear completely relaxed and sometimes even convulsed. Plato observes—when the action of the mind is too strong, the whole system sustains a shock which causes debility. Ramazzini, a celebrated Italian physician, states—"the union of the body and mind is such, that they alike partake of the good or evil which may occur; the mind is incapable of exertion when the body has undergone much fatigue, and one strong exertion of the mind destroys the body, by dissipating the animal spirits necessary for its support."

To prove the immense influence which the mind exercises over the body, it will be sufficient to state—1st, That when we are studiously engaged, the brain is excited. 2dly, That every part of the body which is excited must become fatigued,

and if that excitement is continued for any length of time, the functions will be deranged. 3dly, That all nerves proceed from the brain. 4thly, That the nerves are one of the principal organs in the body, and that they are necessary for the performance of every function; and should their action be disturbed, every part of the animal economy must sympathize.

By an attentive perusal of these remarks, it will be seen that when the brain is injured by the action of the mind, it must necessarily follow that the nerves will suffer, and consequently the bodily health become at last affected. The brain, which is the part principally engaged, the nerves, which derive their origin from it, and the stomach, are the parts which soonest indicate the pernicious effects of excessive study, which, if long continued, pervades every part of the system.

The effects of mental fatigue are the

loss of appetite, and cessation of digestion, causing general debility; as this increases, spasms, convulsions, and total loss of the senses supervene. The first symptoms which characterize these disorders are irresolution, inactivity, and a disposition to seriousness; sadness, and dread of futurity; an over-attention to the health, and, upon any sudden occurrence, a fear of imminent danger. Many will be obliged to abandon their favorite employments; for the weakness of their nerves renders them incapable of attention, the memory becomes obscured, and the ideas confused, which unhappy state is succeeded by head-ache and palpitation. By the aid of rest, generous diet, and exercise, a partial return of vigour is effected, which soon, however, disappears.

The persons, who suffer most from disorders of this description, are those whose ideas are directed continually to one ob-

ject; by which means the mind is so strongly impressed by it as to be rendered incapable of receiving any other impression, on which account it becomes fatigued, and ultimately destroyed. If any one particular muscle be kept continually in action, the body will suffer more than if the same degree of action was exerted successively on each individual one; so it is with the mind: if different sensations were communicated, the fatigue would be less.

When the mind is engaged, the brain receives a great quantity of blood, which gives too strong an action to the vessels, producing head-ache, inflammation, delirium, convulsions, and apoplexy, and opens the door to an infinite number of maladies, both of body and mind. Who has not experienced the unrefreshing sleep which follows mental anxiety?

A slight irritation of the brain produces

watchfulness; greater irritation causes convulsions, and a higher degree produces apoplexy, a death too frequent among men of sedentary habits.

It must not be imagined that profound study alone tends to weaken the nervous system—for any employment which requires the continual exertion of the eyes will weaken the head, and cause giddiness, an inclination to vomit, and a sensation of languor.

The different vessels which compose the human body contain fluids, which are constantly circulating through them: while these vessels act with neither too strong or too weak a force—when the fluids are of their natural consistence, and are not moving with too great velocity, a man is in health. But it is the motion of these fluids which is of the most consequence: as, when that changes, the fluids and solids change with it; if the motion

is too rapid, the solids become thick, and the fluids are impoverished; if too slow, the fibres of the muscles are relaxed, and the fluids become attenuated.

The heart is the first agent in producing the movement of the blood; but it could not be effected by that alone: the Author of Nature has therefore ordained other means to assist in aiding the circulation and augmenting the action of the blood-vessels; muscular contraction is one of the most efficacious, as may be ascertained in blood-letting, the surgeon being frequently obliged (from the blood not flowing so freely as could be wished) to make the patient move his fingers, for the purpose of bringing the muscles into action, which necessarily increases the current of the blood.

The principal effects of exercise are to strengthen the muscular fibre, to keep the fluids in their natural state, to give an ap-

petite, to facilitate the secretions, above all the perspiration, and to produce an agreeable sensation in all the nervous system. The effect, on the contrary, produced by a sedentary life, is to destroy the tone of the muscles, and to make them, from disuse, incapable of sustaining the slightest motion; the circulation being deprived of a considerable agent is abandoned to the sole force of the heart and vessels, which is at first felt in their small ramifications, and eventually throughout the entire system. The natural heat is diminished, the humours begin to stagnate, become corrupted, and the functions appear altered, the secretions and evacuations are no longer performed, and the body becomes feeble. Regular evacuations are the most certain indications of good health: if they are not regularly performed, the acrimony of the juices, by degrees, undermines the constitution—the

strength diminishes, the blood becomes poor and thin; from this cause proceeds another disease—dropsy, so often met with amongst men of sedentary habits, and which, in some instances, causes an effusion of water on the brain. This malady is noticed by Van Swieten, who, in speaking of the effect, says—"Studious men, and those who lead a sedentary life, are often exposed to a species of apoplexy, that proceeds from this cause, and which makes its appearance by degrees; at length they become languid and indolent, their spirits are cast down, the memory fails, they become stupid, and often remain in that state for a length of time before death puts an end to a miserable existence." I have occasionally seen men of the first talent, who have done much in the advancement of literature, live for more than twelve months in complete idi-

otism, and at last die by this species of apoplexy.

The parts which first feel the want of exercise are those in which the vessels, naturally weak, are most in need of aid to keep the fluids in their proper state of activity, and above all, those organs destined for the important function of digestion. The stomach being weakened, the nature of the juices are altered; digestion goes on slowly, and is imperfectly performed; for the power of the organs being diminished, the different aliments are not converted into good chyle, but become putrid. Vegetables are decomposed, and form acids, which irritate the nerves, causing pain in the bowels, cramp, and that unpleasant and painful sensation called heart-burn. Meat turns rancid, occasions putrid eructations, continual thirst, diarrhœa, fever, general de-

bility, and an inexpressible feeling of uneasiness. The juices themselves, which the stomach continually secretes, become depraved, and incapable of performing the office they were destined for, and destroy the appetite. The intestines are also affected, and the action of respiration, which, when natural, presses upon the different organs, while we inspire, causes an increased circulation, which is diminished by the want of tone in the muscular fibre, and the intestines consequently have not the power of expelling their contents: hence, that constipated state of the bowels, to which sedentary men are so subject. The fæces, by their induration, press on the neighbouring part, and by becoming acid, irritate the intestines; the putrid parts being absorbed and carried into the blood, the whole system is contaminated. These are not the only parts which suffer from this want of activity—

all the others sympathize. Those which are destined for the secretion of the bile become totally deranged, the bile thickens, and does not pass into the intestines, part being detained in the gall bladder, undergoes a further change, is inspissated, producing gall stones, occasioning excruciating pain, which can only be relieved by their passing into the intestines, or being voided; but it unfortunately happens that they are sometimes of so large a size as to render this impossible. Indeed, if the patient's constitution be destitute of the requisite energy to pass them, he may be doomed to suffer for the remainder of his life. When the bile is thus vitiated, it acquires a great degree of acrimony, giving rise to abscesses in the liver. Amongst the diversity of evils to which men of this class are subject, caused by a defective circulation and derangement of the digestive organs, we must reckon hypochon-

driacism, which may be divided into two different species—that which is simply nervous, caused by intense study, producing a torpor of the sensorium, and that which depends on defective digestion, and a diminution of the evacuations produced by inactivity. It will be easy to comprehend in what manner these two species of disease are so often found united, and why they are generally so difficult to eradicate. The lungs also, from the delicacy of their structure, are very subject to disease; and I have frequently found asthma, inflammation, suppuration, and abscesses produced by the irritation attendant upon mental exertion. Another effect of a sedentary life is the diminution of insensible perspiration, a very considerable and important evacuation, the regularity of which is essential to health. The vessels which perform this, are so weak, so small, so remote from the grand source of the circu-

lation, and so exposed to injury from external impressions, that if the circulation is not assisted by exercise sufficiently powerful to excite a certain degree of action in these vessels, it is almost impossible the health can be good. The superfluous fluid, which should have been carried off by the pores of the skin, is thus driven back upon some particular organ, and produces pain, cholic, diarrhœa, cough or fever. It having been shown that mental anxiety tends directly to debilitate the nervous system, it may not be improper here to remark, that indolence is capable of producing, nay, often does produce, the same effects, especially in weak-minded persons.

The nervous system is certainly very important to the well-being of the individual; and when any of the essential functions are deranged, it invariably participates: whenever this is the case, we may

rely that some incipient disease is advancing, which will require the most attentive observation to counteract.

Mental anxiety and want of exercise we have already seen is one of the *principal* causes of the diseases incident to sedentary men, but there are others which I shall now notice:—1st. As the posture of a man, while sitting, impedes the flow of blood into the inferior extremities, and the bent position of the body constrains the different organs of the abdomen, their functions are impeded, digestion is again interrupted, and the stomach, being so frequently compressed, suffers more particularly. These mechanical irritations, joined to those already noticed, render sedentary men so subject to diseases of the stomach and intestines. The blood also, being obstructed in its return to the heart by the veins, is determined by its own gravity to the fundament, and produces

piles, and that troublesome, painful, and often dangerous, disease, denominated fistula.*

More clearly to point out the nature of these complaints it is necessary to observe, that the blood having been sent, by the heart, through the arteries, for the nourishment of the body, is returned by the veins which are remote from the influence of the heart, and, from want of impulse, returns through them with considerable difficulty; which circumstance sufficiently indicates, why any addition to this natural obstacle may be so increased as to cause these diseases, and conse-

* I cannot let pass this opportunity of acknowledging the great advantage I have derived from the use of an instrument invented by that excellent practical surgeon Mr. Whately, in the cure of this disorder, and of thus publicly testifying my gratitude for this and many other acts of kindness for which I am indebted to him, during my professional studies.

quently explains why they are so frequent with persons leading an inactive life.

Any one whose mind has been much and anxiously engaged during the day, ought to retire to rest early, otherwise that repose, which it is desirable should be calm and tranquil, will be so much abridged, as to render it insufficient to produce the effect originally intended by Nature, that of recruiting the vital energies, which had been previously exhausted: for the brain having been greatly excited, the ideas are continually returning, either preventing sleep altogether, or rendering it more a kind of stupor. Sleep, says the celebrated Dr. Cullen, is a state of the animal economy which spontaneously occurs in man, and perhaps in all other animals, in their natural and healthy state, once in the course of every diurnal revolution of the sun. In man it is variously modified, but in its most natural

and complete state, it consists in a total cessation of the exercise of all sensation and thought, and consequently of all intellectual operation; and at the same time, therefore, all exercise of volition, or the exercise of will, and every motion, from the brain to other parts of the system, entirely ceases. Natural sleep occurs more or less readily as the causes producing it have been greater or less; and chiefly according to the labours of the preceding day—but more certainly, if those irritations, commonly arising from the exercise of the functions, or from external impressions, are more completely absent; and particularly those of the former kind, arising from intercepted digestion, from the earnestness of mental occupation, and from the increased action of the sanguiferous system. When sleep occurs in spite of the circumstances that have a tendency to prevent it, it will be broken by

those irritations, that is, by the causes of watching frequently intervening; or if these do not proceed so far as to excite watching, they may render the sleep incomplete, by producing only a partial interruption of thought: and as this exercise of thought, when it is partial only, must be irregular, so it must produce that incoherent and inconsistent thinking which we call *dreaming*. According to the degree of the causes, dreams may be mild, and perhaps agreeable; or, according to the violence of these causes, they may be more turbulent, and with more emotion produced. It appears then, that even from moderate causes, they are different, and prove either cheerful or gloomy, according to the tone of mind prevailing in the person. The ancients were well aware of the baneful effects of study, when nature ordained that the faculties should be at rest, and never used to dedicate the

night to serious employments. In continuing our employments during night, we subvert the law of nature, who destined the commencement of it to repose; we are invited to it by the humidity of the atmosphere, by silence, darkness, and the example of every living animal, as well as by the vegetable creation. The greater part of animals feel sensibly their powers diminish at sun-set, and indulge in sleep till morning returns, when the air regains its wonted salubrity.—The dangerous influence of the nocturnal air is strongly marked in some people: Van Swieten says, he knew a man affected with the gout, who could never read after sun-set without causing an increase of all its symptoms. Nor does the constitution suffer less from meditation while in bed; for long application of the mind, as before stated, causes a great determination of blood to the head, which is favored by the

horizontal position of the body; the sleep which follows augments it, and that organ must, for the same reason, suffer by this pernicious practice, as the body does by the privation of sleep, which is the consequence of sitting up late at night. The head becomes violently affected, the nervous system is deranged, palsy is produced, and the memory fails.—There is no function, when deranged, so difficult to re-establish as that of sleep; and, though we sacrifice it without the least feelings of regret, we are probably doomed for years to mourn the loss of it; and well may we exclaim with the poet—

O, gentle sleep,
Nature's soft nurse, how have I frighted thee,
That thou no more wilt weigh my eye-lids down,
And steep my senses in forgetfulness?

The dense and impure smoke which arises from the different lights made use of

by those who study at night, augments in no small degree the danger, by adding to the corruption of the surrounding atmosphere; they are equally hurtful to the eyes and lungs, and although the burning of wax lights may, in a slight degree, remedy this, it must nevertheless, in some measure, always exist.

The confined air which men shut up in studies, counting-houses, manufactories, &c. are continually breathing may be reckoned as another cause of disease, and to which too little attention is paid, though it aggravates much every disorder to which they are liable; pure air is even more essential to life than food; for animals will subsist without nourishment for a length of time; but when deprived of air they perish in a few moments; they can only breathe a certain quantity of air for a limited time, after which it becomes the most deadly poison, and

produces suffocation as effectual as the most noxious gas, or a total absence of air. At a musical exhibition in the Theatre of Oxford (some few years ago), which was much crowded during the entertainment, the candles were observed to burn dim, and some of them went out. The audience complained of faintness and languor; and had the animal effluvia, which renders the air unfit for respiration, been still further accumulated, or longer continued, they would all have perished.

A pure, open, and refreshing atmosphere strengthens the system, facilitates the respiration and perspiration, and animates the whole frame. There is no one but can verify this observation by his own experience, and of course must know of what great utility it must be to men of sedentary habits, who, far from enjoying it, on the contrary, generally remain all day in an atmosphere, which, instead

the gums and the teeth, and getting down to the jaw loosens them, and deprives the stomach of the help of mastication, so important to every one, but most especially to those who, like sedentary men, are so liable to a debilitated state of the digestive organs. The more the food is masticated the more it approaches to the nature of a fluid, and is therefore much easier of digestion. The great recruit of strength after eating is owing to the introduction of fresh chyle into the system; an animal body, like a vegetable, cannot survive with vigour without the reficient power of new juices to supply the loss of those which were wasted and carried off by the action of the body; for as oil is the pabulum of flame, so that vital fluid blood, in purity and due quantity, is insensibly necessary to feed the lamp of life; and this chiefly depends on the digestive faculty of the stomach rather

than the quantity or quality of the aliment, since daily experience shows us that plenty of the most nutritive aliment will be insufficient to sustain the infirm, whilst those of strong constitutions and good digestion will gain strength, though living on the hardest food.

The custom of reading while at meals is one which tends directly to weaken the stomach. The action of the nerves is so essential to the purposes of digestion, that, if the nerves going to the stomach were tied, the food would become putrid instead of being digested; while the mind being occupied suspends the distribution of the nervous influence from that organ at the time it is most necessary; hence the digestion becomes vitiated; the food remains a long time in the stomach and is badly digested; a great quantity of air is disengaged which irritates and distends it, and which,

when it is carried off, leaves the stomach in a very debilitated state.

Xylander, in a letter to Plimpius, on the diseases brought on by the exercise of magistracy, saw with exactness, and explained it in a work conformable to the theory of those times, "That those who took off the heat of the stomach to attend to business were incapable of digesting their food." It has not escaped the notice of many writers on diet.

The ardour for study or business carried to this excess is equally ridiculous and blameable; it does not allow time for taking proper nourishment, and is frequently accompanied by one meriting as much censure; I mean that of not attending to the calls of nature. The fæces being long retained become hard and putrid, and irritate the intestines, alter the natural secretions, and oftentimes cause most dreadful diseases. The little vessels which carry

the nutritious particles into the blood are filled with putrid matter and contaminate it, or what is probably more fatal, is, that the nerves cease to act and are by the extreme distention rendered paralytic. The bladder and intestines have no longer the power of expelling their contents. Galen, who was well acquainted with these disorders, says he has seen many persons who have retained for a long time their urine, either from being too much engaged, too idle, or from motives of decency, who afterwards lost the power of evacuating it. At other times, it produces a disease (incontinence of urine) very opposite in appearance, but depending on the same cause, and only differing from the other in a different part of the bladder being affected. I have often seen persons who, not having evacuated their urine with sufficient frequency, have at last lost the power of retaining it, and it

was constantly dribbling away. But what is more dreadful is, that death has been produced by this indiscretion.—Tycho Braché being at a feast with the Emperor Rodolph II. from long retaining his urine, forfeited his life to his false delicacy.

May we not look upon seclusion as another cause productive of disease in men of this cast of character? it is what they voluntarily impose on themselves at first, and which at last becomes habitual; but it has many real disadvantages. Dr. Blair justly observes, "One of the most distinguished privileges which Providence has conferred upon mankind is the power of communicating their thoughts to one another. Destitute of this power, Reason would be a solitary, and, in some measure an unavailing principle. Speech is the great instrument by which man becomes beneficial to man;

and it is to the intercourse and transmission of thought, by means of speech, that we are chiefly indebted for the improvement of thought itself. Small are the advances which a single unnassisted individual can make towards perfecting any of its powers. What we call human reason is not the effort or ability of one, so much as it is the result of the reason of many, arising from lights mutually communicated, in consequence of discourse and writing." Man was made for man, and mutual intercourse has advantages which cannot be renounced with impunity. Nothing contributes so much to health as agreeable and cheerful society. This moral cause joined to the physical one of melancholy often throw these men into a state of mind, the effects of which are as hurtful as those of cheerfulness would be beneficial; it produces that misanthropy, that ill humour, that dissatisfaction, and that

disrelish for every thing, that it may probably be regarded as one of the worst maladies these men are subject to.

Though Art's fair works and Nature's gifts conspire
To please each sense and satiate each desire,
'Tis joyless all.——— ———

Having pointed out the causes which generally produce the disorders that studious men and those employed in business are so frequently afflicted with, I shall proceed to notice those which depend more on the particular object of their occupation, and also those which are more peculiar to certain organs.— Anatomists are frequently attacked with violent fevers, occasioned by the infected air which they are continually breathing and they are exposed to those diseases which depend on corrupted bile. The putrid blood, &c. of the dead bodies, in

which their hands are continually steeped, often causes great inflammation from the most trifling wound, or the slightest excoriation, as I have often witnessed, and have myself experienced; frequently they prove mortal.

Chymical experiments are not without danger, from the escape of suffocating gases, which are frequently taking place, and to which many chymists have forfeited their lives; Boerhaave would have been killed by an acid vapour had he not had instant recourse to an alkaline spirit, which was very fortunately near at hand, the vapour of which neutralized the acrimony of the acid, and put a stop to the violent spasms of the chest it had excited.—Botanists have sometimes perished in pursuing their researches; their maladies are caused by the same means as those of artisans.—Persons employed in dry-grinding are quickly affected with

pulmonary complaints, as are also hair-dressers, bakers, masons, bricklayers, laboratory-men, coal-heavers, and chimney-sweepers; so are leather-sellers, and dressers of flax and feathers. Men engaged in these employments often struggle with a dry cough, which ultimately terminates in consumption or asthma, caused by the particles of dust, the fumes of metals, and confined air, whereas had they removed to a purer atmosphere they might soon have recovered their health. I have often seen bakers, grocers, and type-founders affected with a peculiar disease of the skin produced by their employments.—It is said that more than one half of the men employed in coal mines die of consumption, caused no doubt by their working in what are called damps, in which the air is unfit for respiration.

I shall now make some observations on

the diseases of particular organs caused by long continued application. The eyes suffer considerably by this practice; the continued fatigue irritates them, and frequently causes the eyelids, and the external parts, to become inflamed; but more generally, it is the nerves alone which are affected without producing any external symptoms. The eyes of many young men have become so exquisitely sensible as to render it impossible for them to support the light, so that they have been obliged to remain, and read in rooms from which the light was so much excluded as to make it difficult for the generality of persons to distinguish even the largest characters contained in books: the vacillations and smoke of candles produced so much pain, as to render their presence quite insupportable; nor could they even for any length of time bear the effects caused by a small lighted taper. There

are others, who, after reading a few pages, have their eyes filled with tears, which become dim, and at last it is with difficulty they can distinguish any thing. The disorders of the eyes, produced by intense application, by which the sensibility of the nerves are greatly increased, are extremely various, and require the most serious attention. I feel myself here called upon to notice a most pernicious custom, and one which is unfortunately extremely prevalent, that of applying astringent washes to inflamed eyes. I have daily opportunities of observing the direful effects of this practice, and have frequently had cause to lament having seen those who have become irrecoverably blind by the use of them. Surely no one would ever think of applying irritants to a part already so much irritated as to cause inflammation in any other part of the body? Why then should

we act differently with the eyes? I have already stated that the effect produced on the brain by study was that of causing an increased determination of blood to the part, producing a turgesence of the vessels. The same relates to the eyes; for by long continued application the blood is propelled with greater force into the vessels of that organ and distends them; so that those which before only admitted the seriferous particles of the blood, are now filled with the red particles, and give the eye that particular appearance of redness which is seen when it is inflamed. When the eye has the redness just now mentioned, together with a sense of heat, nothing acts more beneficially than warm anodyne fomentations.

Orators are exposed to diseases which depend on their vocation. Declamation, in a certain degree, is attended with most beneficial effects, and is frequently of

essential service to those in whom the function of digestion is imperfectly performed; but long continued orations, during which the ordinary course of respiration is frequently interrupted, become extremely hurtful to the lungs, which it irritates and inflames, giving rise to hoarseness, pains in the chest, cough, spitting of blood, loss of voice, suppuration, general debility, and ultimately consumption. Cicero was attacked with some of these disorders, and was recommended by his physicians to relinquish study for two years; he followed their advice, and, by rest, strengthened and rendered himself capable of returning to his avocations. Counsellors and clergymen are particularly exposed to diseases from this cause; for both are obliged to study with great assiduity, and they are likewise compelled to hold long and forcible arguments, and to lead

a sedentary life: the blood consequently flows but slowly through their lungs; they are therefore more exposed to danger, and less capable of sustaining such strong efforts. A long and vehement discourse frequently produces hernia or rupture, by the violent compression which the intestines suffer in too great an inspiration, which, though it may not be so distressing as diseases of the lungs, is, nevertheless, replete with danger; they may in some measure be hindered from taking place by the use of a truss, which, when the intestine has once descended, is absolutely necessary; for, without it, every time they have occasion to speak loud, to cough, or, indeed to use any kind of exertion, they are exposed to such an aggravation of the disease as may in a few hours cause their dissolution. Actors are likewise exposed to the same consequences. Moliere the famous French

performer died of a spitting of blood, brought on after having played in (*Le Malade Imaginaire*) one of his own pieces with much eclat. Henderson, one of our own tragedians, and a man of great merit, died of apoplexy. Singers, and those who play on wind instruments, have frequently the lungs inflamed and ulcerated. Morgagni saw a young man, who possessed a fine voice, and who consequently exercised it frequently, thrown into a consumption; the ulceration extended along the windpipe into the throat: he was suffocated in attempting to swallow the yolk of an egg.

Such, then, are the diseases incident to literary and sedentary men; and happy is he whose diversity of avocations compel him frequently to change his situation and ideas, for by these means his body has the necessary exertion, and his mind the necessary relaxation; for particular

habits, acquired by long custom, are found insensibly to gain ascendancy over the most intelligent minds, and to produce many very extraordinary effects, to the prejudice of health, as well as the moral or immoral tendency of the passions. The human body is composed of materials which must necessarily decay, and frequently be put out of order; we are subject to diseases and the influence of the passions, which affect the spirits and intellects—and when we consider the number of exquisite movements in a state of health, and that all parts must conspire to perform their proper offices, and that the least failure occasions disease, we may well wonder we so long possess "this muddy vesture of decay."

Although I mention these diseases, as being the consequence of sedentary employments, it must not be supposed that those who are exposed to them should al-

ways suffer in the same way, or in the same degree. The difference of temperament, the age, and the different concatenation of events, cause a considerable variety in the effect, which shall now be noticed.—There is probably no one so completely organized, as to have every viscus in the same state, but we generally find one which is more debilitated than the rest, and this it is which first feels the impression produced by mental anxiety. If the stomach should have been naturally weak, or be rendered so by errors in diet, it will soon become affected, but the nerves may not as yet feel it. In persons whose nerves are weak, but possessing a strong stomach, the nervous system will suffer before the stomach becomes deranged. If there is want of tone in the muscular fibres there will be a feeling of languor, stiffness, extreme debility, and dropsical swellings, previous to the stomach's being affected.

Those in whom the lungs are not well formed will fall into consumptions, before any derangement is perceived in any other viscus. If the vessels of the head are debilitated there will be continual head-ache and bleeding of the nose, to which young persons are particularly liable.

The strength of the constitution is again not without its dangers; for young men of robust constitutions, who give themselves up to the study or counting-house with indefatigable ardor, cause, by the action of the mind, an increase of action in every part of the body; and inflammation, which is the consequence of irritation, is thereby produced in those of strong temperaments, which frequently causes death on the first attack: but if, by relaxation of the mind, together with the aid of proper medicine, they are fortunate enough to regain their health, and they immediately (as is frequently the case) ap-

ply themselves with the same assiduity, they are afflicted with the same disorders, and are, by continued fevers, at length reduced to a state of great debility, and from which there is but little hope of their recovery, as nothing so much exhausts the powers of life as an increased action of the heart and arteries.

If sedentary employments produce in adults the diseases I have enumerated, how much more hurtful must it be to children; and there are many who have been sacrificed by long-continued application; indeed we frequently see those that are this way inclined, whose talent is astonishing, commence by being prodigies and end by becoming fools. This acuteness of sensibility is often very remarkable in those children pre-disposed to scrofula, which the want of exercise and the consequent debility never fails to exasperate. Childhood should be devoted

to exercise, which strengthens the body, and not be spent in study, which debilitates it, and causes a train of most dreadful sufferings. Nature never intended we should arrive at perfection, but by slow and gradual means. When the mind expands prematurely, and children are permitted to make great application in cultivating science, the body cannot receive the necessary supply of nourishment, the strength therefore fails, and every function ceases to act; a striking proof of which is afforded in the celebrated John P. Baratier, as recorded by Dr. Johnson. He was born at Schwoback, in the year 1721: at five years of age he understood Greek, Latin, German, and French; he next studied Hebrew—and at nine years old was able to translate every part of scripture into Latin. When ten years old he entered the university of Altdorf, and in the same year wrote a letter to

Mons. Le Maitre on a new edition of the Bible, Hebrew, Chaldaic, and Rabbinical, which is inserted in the Bibliothèque Germanique. In the year following he published the Travels of Benjamin of Tudela, translated from the Hebrew into French. He was afterwards admitted a member of the Academy of Berlin, and created M. A. by the university of Halle. At seventeen he was reckoned the best informed man in Europe. Though he possessed such energy of mind, he was subject, from his earliest infancy, to many diseases; and at eighteen he was attacked with a cough, which was soon followed by loss of appetite, sleep, and such a train of evils, as made him most anxiously wish for death, as the only relief for his sufferings, which happened when he was nineteen. I have seen, says Boerhaave, a young man of the first talent, in fact a complete prodigy, who was cut off at the

age of twenty-five; and another, who was extremely clever, who devoted day and night to study—who gradually wasted away without the characteristic of any particular disease, at the age of nineteen. There are many born with most superior talents—of active and penetrating minds, who give to study or business the time destined by nature for repose, who are afflicted with a most distressing and dangerous depression of mind, and, in the flower of youth, become victims to their exertions. In children the blood circulates with much greater velocity than in adults, and their constitutions not having received sufficient strength to resist the effects produced by the excitement caused by study, they sooner sink into a state of debility. Compare the children employed in manufactories with those working in the open air—in the former we see them ricketty, scrofulous, distorted, and,

indeed, nothing but disease is manifest: but in the latter, who range in a pure, uncontaminated atmosphere, we find the glow of health on their cheeks, their dispositions lively, their appetite good, and their faculties of mind extremely acute. It is cruel and absurd to confine children for a length of time to any employment—it diminishes the energy of their mind, destroys their health, and annihilates their talents. Anaxagoras, an ancient philosopher, in his last illness, being asked by his friends if he had any wish ungratified, gave this answer—"My only desire is, that the month in which I die may be kept as a yearly holiday by the children of Lampsacus."

The evils which too much fatigue produces in children are much aggravated by their being compelled to continue at those studies or employments to which they have a natural dislike; which, indeed, at

all ages is pernicious, for the disgust which is created, joined to that of the excitement produced in the brain, renders them more liable to be the victims of disease. Boerhaave has noticed a most striking alteration produced for the better in those who had been obliged to occupy their minds in study or employments for which they had a disrelish, on their being relinquished, and following others more congenial to their taste.

> ——————All constraint,
> Except what wisdom lays on evil men,
> Is evil, hurts the faculties, impedes
> Their progress in the road of science; blinds
> The eye-sight of discov'ry, and begets,
> In those that suffer it, a sordid mind—
> Bestial, a meagre intellect, unfit
> To be the tenant of man's noble form.

Though premature study is thus prejudicial to health, it is not less dangerous to commence at too late a period of life; for those persons who have been indolent in

their younger days, cannot suddenly devote themselves to study, without incurring the risk of producing such a degree of excitement as will be attended with the most fatal consequences. Nature is only led on by degrees; when the mind has been long occupied by any particular object, it is with the utmost difficulty we shall be able to change it. If we review (says the famous Haller) the history of human life, we shall find that in infancy we have hardly any memory; only simple impressions, which soon vanish, but which notwithstanding excite strong ideas in the mind, as is obvious from the crying of infants. The memory is perfected by degrees, and the ideas received by favorite objects and familiar persons remain impressed in the mind of the infant; while, at the same time, the imagination likewise increases, which is often very powerful in young children: for instance, terror

in no age produces more violent or more deplorable effects. Afterwards the number of our ideas increases, the faculty of preserving past ideas is impaired, and at the same time the power of imagination becomes torpid. Thought resides in the soul, it attends to the sensations which are either brought by the senses, or recalled by the imagination; frequently also by the mere signs which recur to our mind. Attention is when an idea occupies the mind principally or solely for any length of time. The comparison of two ideas instituted by the mind, is called judgment or genius, when the mind, by comparing them, discovers them to be alike or dissimilar. Genius consists in a vivid sensation, conjoined with rapidity of thought, so as instantly to abstract from notions their points of similitude or dissimilitude. The principal source of judgment, invention and wisdom, consists in

the slow examination of ideas, by which they are considered by the mind in every point of view, and in the attention of the mind being confined to one object, to the exclusion of all other ideas.

Sedentary employments are equally dangerous to those who are far advanced in life; and we ought therefore to diminish our mental occupations; for the faculties of the mind are perceived to lessen with our bodily strength; and those persons who know how to moderate their anxieties in proportion to their age, will be the most likely to preserve their health in the decline of life.

There are other causes besides excessive study and sedentary employments, which will produce many of the diseases before alluded to. The passions of the mind cause many disorders by the impressions made on the nervous system. The human mind is principally actuated

by two passions, hope and fear; the former increases the energy of the nervous system, and, as it were, lifts it above itself, the latter sinks it below its natural standard. Most of the subordinate passions appear to be compounded of hope. Terror is a species of sudden fear impressed with extreme violence. Hope promotes a free circulation of the blood, stimulates the nerves, and increases their power on all vital parts, assists digestion, gives strength and vigour to the limbs, and fortitude to the mind. Fear, on the contrary, deadens the feelings of the nerves, chills the blood, retards its motion, impairs the appetite, and depresses the spirits. Joy, when moderate, contributes to health; but when sudden or excessive, produces a kind of torpor or palsy of the nerves, suspends the motion of the heart, and occasions a mortal syncope. Sorrow is accompanied by lan-

guor, loss of appetite and sleep, giddiness of the head, effusion of tears, and fainting; it suspends the secretions, respiration becomes difficult, and it is the cause of frequent sighing, to relieve the breast of its oppressive load.

Happiness and misery fill up the outlines in the portrait of human existence. Every one naturally endeavours to attain one and avoid the other, but by different means, which are often disproportionate to that end. Extravagance of hope often ends in disappointment, and even a series of pleasurable events at last create satiety. The violent passions of the mind, disturb its union with the body, and injure health. A pure and uncorrupted conscience, the reward of virtue, will best reconcile them to each other, and cause them to act in union, that will speak peace to the mind whatever the world may say, and shield it from the malignant effects

of slander and unmerited abuse. That man will enjoy the best health who can expostulate with the extravagance of his ideas, and convince himself that what he prefers most is not always best for him; who is not arrogantly elevated by the delusive smiles of prosperity, nor servilely cast down by misfortune, which may often be converted into a real benefit.

———If misfortune comes she brings along
The bravest virtues. And so many great
Illustrious spirits have convers'd with woe,
Have in her school been taught, as are enough
To consecrate, and make ambition
Even wish the frown beyond the smile of fortune.

Having thus pointed out the state of the body and mind, and shown how, by their mutual sympathy, they co-operate with each other, I shall proceed to make some observations on the best means of preventing the diseases arising from ex-

cessive study or sedentary employment. The first difficulty to be overcome with those who are too fond of study or too anxious about their affairs is to convince them of their dangerous tendency. The difficulty is much augmented by the good opinion of themselves, which is, I am sorry to say, frequently met with in those persons whose abilities give them some degree of superiority over the generality of mankind, or the silly pride of those who estimate their worth by their riches. However anxious we may be, or whatever arguments we may make use of (to try and convince them of their dangers), it is but too often in vain, as they deceive themselves by many false ideas: one depends on the strength of his constitution, another thinks that as he has become habituated to it, the effects pointed out cannot be produced, others hope to escape because they have not as yet felt them, and

some are regardless of the bad effects which have already appeared, and are heedless of the disease under which they labour, provided it does not incapacitate them from attending to their favourite pursuits. Even when the diseases have arrived to such a height as to cause dejection of the mind, and produce such effects on the nervous system as to make them fearful of every occurrence, we are not more fortunate; for their gloomy state of mind makes them despair that any thing will afford them relief. We have on record many lamentable instances of persons labouring under this state of mind (in which even the most distant hope of succour is excluded) having committed the shocking crime of suicide. This, and the difficulty of re-establishing the health of men possessing such ideas, should act as an additional reason, for strenuously urging a proper regulation of conduct, and of at-

tending to the best means of preserving health.

The first preservative, without which every other means must fail, is the occasional relaxation of the mind. Time spent in repose and agreeable company cannot be said to be lost; for it strengthens the body and gives the mind the power of exerting itself with vigour, and those moments consecrated to relaxation will be greatly recompensed by the uninterrupted enjoyment of good health. It is during the moments of recreation that the fancy is struck with the most happy ideas; then the mind expands itself.

Animus eorum qui in aperto aere ambulant attollitur.

The comparison made by Plutarch is very apposite. "A little water," says he, "nourishes and strengthens plants; too great a quantity kills them: so it is

with the mind; moderate exertion strengthens it, but excessive fatigue destroys it."

If there is any case which demands more attention than another, it is that in which the head is the most likely part to be affected; for that is with the greatest difficulty restored to its natural functions.

Having stated that inaction was the second cause of the diseases incident to literary and sedentary men, it appears that exercise is necessary for guarding against them, and it will prove much more efficacious if taken in the open air, which frequently produces a gradual, salutary and lasting change in the habit, and is attended with a circumstance I should think likely to recommend it, which is, that it must be beneficial to all, and cannot be injurious to any one. Pure air is so necessary to the existence of animals that it is not only taken into the

lungs during inspiration, but it is largely mixed with the food, and forms, indeed, a part of the animal system. The florid colour of the pulmonary blood, or that which has circulated through the lungs is owing to its having been impregnated by pure air; when respiration is laborious or obstructed, as is the case in persons affected with asthma, the florid colour of the blood is rendered more faint and pale; on the contrary, when the action of the lungs is uninterrupted, and we breathe a more pure and dephlogisticated country air, the whole mass of blood becomes perceptibly more florid, and imparts to the countenance a fresh and ruddy appearance.

Those men who are shut up in their studies or counting-houses, frequently complain of head-ache; their eyes are hot, the lips and mouth parched and dry, they have an unpleasant tightness in the chest, and pain

at the pit of the stomach; sometimes they are drowsy, subject to watching, and a sense of languor. If they still continue at their avocations every symptom is augmented, whereas three or four hours exercise in the country would have dissipated them, recalled their serenity of mind, and strengthened the constitution.

It is to be regretted that men of sedentary employments are not sufficiently convinced of the connection between the mind and body. The ancients were well aware of it, as may be inferred from many of their writings. Moses Maimonides, the oldest of the Arabian physicians, says, "Seeing that health contributes much towards the cultivation and knowledge of divinity, and that men of weak health cannot sufficiently contemplate the works of nature; it is, therefore, absolutely necessary that they should carefully avoid every thing detrimental to health, and on

the contrary make use of every means in their power which can tend to preserve and strengthen it." "The disposition of the mind," says Descartes, "depends so much on the temperament of the body, that if one could find any means of increasing our penetration, it is to exercise we should look for it." This observation is verified by that eminent physician Hoffman, who mentions ideots who came to the proper enjoyment of their senses by being compelled to take exercise. All those whose avocations are sedentary should never fail of devoting at least one or two hours a day to this purpose, which without doubt is most proper before dinner. Walking has many advantages; it is the exercise I should decidedly prefer, and most strongly advise, as bringing every muscle of the body into action, and carrying off the superfluous nervous irritability. It should be frequently had

recourse to during the day, and never continued when it has caused fatigue. Although a person may not be able to walk more than one mile at first, by repeated attempts, he will at length walk five or even ten miles, without feeling any degree of lassitude. Horse exercise is certainly very salutary, though it cannot always be had recourse to: it is of essential service to the head, but above all to the viscera; for it prevents the accumulation of fæces by exciting the peristaltic motion of the intestines. But it does not, like walking, propel the blood into the extremities; for those who are in the habits of riding very frequently have their hands and feet extremely cold. Herodicus, the master of Hippocrates, is said to be the first who used the gymnastic art, and he recovered his health by that means, and though naturally of a weak and delicate constitution he preserved

his health and faculties till he was one hundred years of age. He no doubt carried it to excess in some instances; which is often the case with those who are enthusiastic in their discoveries and are not sufficiently aware of the benefits and dangers which may arise from them, though he carried it to a faulty extreme by the indiscriminate use of it in all diseases. Surely the moderns are much to blame in expecting to remove some of them without it, and particularly those arising from sedentary employments, or such as are caused by weakness or some fault in the solids; for to them the power of exercise is immediately applied. Exercise increases bodily heat, by rendering the blood more fluid, and promoting a free and *equal* distribution through the whole vascular system. Many diseases, therefore, proceeding from a sluggishness or any defect in the circulation of the blood,

may, by exercise, be often effectually removed; such as nervous and hypochondriacal disorders, ague, rheumatism, and palsy. It is, indeed, a sovereign remedy either in preserving or restoring health: it assists the secretions, renders the body less liable to the vicissitudes of the weather, or the attack of putrid diseases; in a word it animates every part of the system, and gives alacrity and vigour to the mind.—As the animal juices are accumulated by nourishment and rest, so are they consumed by abstinence and motion; and it is a circumstance of the highest importance to health that the natural balance may be kept up between the solids and fluids. The salutary power of exercise and good air is particularly exemplified in laborious country people, who, notwithstanding their indifferent food are generally hearty and strong. They have a much better appetite and digestion than

the indolent. By the increased heat attendant upon exercise, the oily and watery parts of their food, such as it is, will be more uniformly mixed, and worked up into a proper degree of richness and consistence for the nourishment of the body.

Hismonæus cured himself of nervous debility; and Galen informs us that being himself of a naturally delicate habit, he always dedicated some few hours in the day to exercise. Socrates used to play with his children. The Grand Pontiff Scævolius and Scipio used to play at battledore, and amuse themselves on the sea shore, in order to relax the mind, and preserve their health, strength and cheerfulness. The Cardinal Richelieu amused himself with gentle bodily exercise, to ease his mind from the laborious occupations of the cabinet: Anthony de Grammont coming once unawares upon him,

when quite alone, found him without his coat, jumping about the room.

When we find men like these amusing themselves in this way, may I not venture to recommend it to even the most learned of our days without the fear of wounding their feelings. A sea voyage is very beneficial, and when it can be obtained, should never be neglected. It promotes the functions of the liver, and favours the due performance of every secretion and excretion. Octavius Augustus began while young to study the fine arts with much assiduity: he was afflicted with the diseases incident to literary men; but he proved himself wiser than many, for he knew how to avert the impending evils, and by relaxation and exercise regained his health. Riding in a coach cannot be called exercise and it will not afford much benefit: it should be left for those per-

sons that have lost the use of their limbs. Men of sedentary habits can always take exercise more congenial to health, if they do not delay too long. The different kinds of exercise by which they would be most benefited are those which call every part of the body into action, such as walking, fencing, sparring, tennis, billiards, skittles, and cricket; some of these have fallen into such disrepute that many persons would be ashamed to be seen engaged in them; nor can they be brought to believe that the abandonment of these useful recreations is one of the principal causes of the great and lamentable increase of nervous disorders. It is much to be wished that the gymnastic art should be as it formerly was, the object of attention to the masters of schools.

Those men, who are anxious to palliate their want of activity, may say, there are many persons who have lived to a great

age, and their health has not been injured, though they were not in the habits of taking exercise, and that artisans do not suffer any of these diseases; but, they should recollect there is an essential difference between one who is mentally occupied, and who is also confined to his desk, and one whose employment does not require any exertion of mind, and who is continually in motion. If it should be urged that women enjoy good health, though they lead a sedentary life, I think the case is still less applicable; for Nature has made them more susceptible of agreeable sensations, has given them more lively dispositions, they talk more, eat less, their minds are far less occupied by intense thinking. Their sleep is not interrupted by the disturbed state of mind which long attention and anxiety occasion, and there are innumerable other incidents daily occurring to them, which do not

happen to men; which circumstances are sufficient to enliven the mind and increase the flow of blood, and cause its equal distribution through the whole system, without fatiguing any particular organ.

With respect to artisans, it must be acknowledged they do not take as much exercise as could be wished, still they have a decided advantage over literary and sedentary men, who are continually confined to the desk or counting-house; for although they continue at work during the week, still their labour is not of such long continuance as among the latter; besides, they enjoy themselves on Sundays and other days of relaxtion, which are continually occurring; there is also a great difference in many other respects; for although the whole body may not at times be in motion, still some part or other of it generally is, and which is not unfrequently pretty active; in some arts

it is so considerable, as to be attended with great fatigue, which if it be not sufficient to preserve their health, still gives this class of persons an advantage over those who are inactive, and spend their days in reading and writing.

Let me not, however, be understood to assert that inaction is not hurtful to many artisans. I am well aware that most employments have some peculiar disadvantage; for the labour of the husbandman, perhaps, is the only one which does not affect the constitution: all I wish to impress is, that literary and sedentary men suffer more severely, and that the energy of the mind tends directly to produce more baneful effects than the employments of sedentary artisans, whose diseases seem to depend on four principal causes:—1st, Insufficiency of exercise and impure air. —2dly, The unwholesome damp situation in which they live (their habitations

being generally crowded and dirty).—3dly The prejudicial effects of certain substances they are preparing, or those used for the purpose of so doing.—4thly, The continual fatigue of one part of the body. Upon these rest all the causes which prove detrimental to their health.

However necessary exercise may be to preserve the health, or to restore it when once lost, it is nevertheless requisite to pay some attention, and not to carry it to excess, lest by abuse it should become hurtful; for excessive fatigue instead of doing good and strengthening the system, never fails to cause debility. We are very liable to run into extremes, and from a state of inactivity to pass too hastily to its opposite, under the fallacious idea that two or three days' violent exercise will do as much good as if taken with caution daily: but this is a most dangerous mistake; for it not only exhausts the

strength and causes faintness; but the vessels being weak, the risk is incurred of producing such an increased action in the blood vessels as to produce the rupture of some of them, and bring on bleeding of the nose, spitting, or indeed, vomiting of blood.

Celsus observes in his Aphorisms, sudden labour after too much rest, or sudden rest after too much labour, is not without danger; changes ought to be made by little and little:—

Begin with gentle toils, and as your nerves
Grow firm, to hardier by just steps aspire.
The prudent, even in every moderate walk,
At first but saunter; and by slow degrees
Increase their pace.
When all at once from indolence to toil
You spring, the fibres by the hasty shock
Are tired and crack'd, before their unctuous coats,
Compressed, can pour their lubricating balm.
Besides, collected in the passive veins,

Their purple mass a sudden torrent rolls,
O'erpowers the heart, and deluges the lungs
With dangerous inundation: oft the source
Of fatal woes; a cough that foams with blood,
Asthma, and feller peripneumony.

Seneca has with great justice observed that the exercise which dissipates the spirits is not fit for those men who have occasion for mental exertion.*

It is of great importance not to take exercise after having eaten a full meal. For digestion, which is neither fermentation, dissolution, nor trituration, but a combination of all these, is promoted by tranquillity, and requires the nervous energy to complete the process. If after eating we make any great exertion, the functions are always deranged; for

* Nam exercitationes, quarum labor spiritus exhaurit, hominem inhabilem intentione ac studiis acrioribus reddit.—Epist. 15.

the continual motion of the stomach impedes the due action of the digestive organs.

We should always, (says Celsus,) rest after meat, and not disturb the mind with thinking, nor the body with walking, though ever so slowly. Riding is most certainly the very worst exercise which can be taken soon after a meal. After having remained a long time without taking exercise, there will be felt some inconvenience when we begin to take it, and it will almost seem to do more harm than good; but it must not be discontinued on that account, for though a slight degree of exertion may cause weariness, still by being repeated we shall find that we are capable of increasing it every day, and in the course of time perceive that we have acquired such a degree of strength in the muscles as to be able to sustain considerable exertion without producing

fatigue, and indeed with the most happy effect. When less exertion of the mind is made, and more exercise taken, the greatest part of the diseases enumerated will be hindered from occurring; but as it cannot be hoped that every one will be convinced of the dangers they subject themselves to, it will be proper to mention such things as may tend to aggravate their infirmities, and to point out such things as may help to preserve their health.

The food (says Hippocrates) should be proportionate to the fatigue; if the strength of the body is greater than the food, it nourishes and strengthens the body; but if the quantity of food surpasses the strength of the body, (that is, if the stomach cannot digest it), it produces a train of evils.

Plutarch particularly notices the propriety of a reciprocal proportion between exercise and food for the preservation of

health, and its importance will be seen on recalling a previous remark; viz. That it is the action of the digestive organs which separates from the food the chyle necessary for our support, and changes it into our own substance. If then these organs, the chief of which is the stomach, be too weak to act on the food, or the quantity of food being too great, instead of being digested, assimilated, and converted to the proper substance necessary for recruiting the system, shall become corrupted, it will remain as extraneous substances, irritating the intestines without affording any nourishment. Let this therefore be laid down as a general rule, that from whatever cause the digestive power of the stomach is deprived of its natural strength, a spoon diet will be the most efficacious means of affording relief. For by this the inconvenience of sleepiness, palpitation of the heart, flush-

ings of the face and the other oppressive symptoms attendant on indigestion, will be alleviated.

Mr. Abernethy, in a very valuable work which he published some time ago, mentions his having been afflicted for a great length of time with a disorder, during which he had no appetite; he, at length, resolved not to eat till his appetite returned; and even then he gratified it very sparingly, eating only vegetable food, and drinking only water. "In one week," says he, "my appetite became keen, my digestion easy, my stomach tranquil, and every symptom of the disorder with which I had been so long afflicted, left me."

It is then the strength of the digestive organs which should be considered; and there are so many causes which have a tendency to destroy their powers, that they cannot be expected to remain long in their natural state. It should be recollected, that though the digestive organs may not be de-

bilitated, yet the insensible perspiration, so essential to the well being of man, (and which Sanctorius, an Italian physician, who indefatigably passed a number of years in a series of statical experiments, ascertained amounts nearly to five-eighths of the aliment we take in, but which varies considerably, according to the season of the year, the constitution, age, sex, and exercise,) not being carried on in sufficient quantity from the want of proper exercise, and the loss therefore not being great, there is less need of replenishment.

If we compare a robust labourer with a man confined to his desk or study, the one being always in the open air, taking continual exercise, is lively; and, from not fatiguing his mind with intense thought, enjoying a refreshing and tranquil sleep—every secretion being performed with the greatest regularity, the coarsest food is not hurtful to him, for he has

every requisite for its being properly digested; which is not the case with sedentary men, many of whom increase the difficulty, by swallowing their food without being properly masticated. Besides, in country people, every organ destined for the secretion subservient to digestion, is in its most healthy state, the muscular fibres of the stomach act with their natural force: in fact, there is no organ but performs its office; the fæces are evacuated, the chyle passes without any obstacle into the blood-vessels, and is soon changed into a pure and wholesome blood, the superfluous parts are carried off by urine and perspiration, and the whole frame remains in a state of perfect equilibrium.

If we were to give a strong working man nothing but broths, poultry, and lght foods, he would soon be hungry, and become attenuated—for he thrives better

on coarse food. Any person of a weak and delicate habit of body using the food which peasants are in the habit of eating, would be affected with violent pains in the stomach, and every symptom of indigestion. Boerhaave says: "There are some sedentary men who are *bon-vivans*, and are not satisfied unless they eat those kinds of food, which they cannot digest; but it is absolutely necessary they should either renounce these or their studies, otherwise the most severe pains, or the most fatal obstructions of the bowels, will be the consequence of their indiscretion."

Attention should be directed to the choice as well as the quantity of food, for errors in one or the other will prove equally prejudicial.

It is not my intention to detail every species of food which is either useful or detrimental to health; but I shall content myself with mentioning the ge-

neral class of aliments which should be shunned, and those which may be taken with advantage. Those which are improper are—

1st. All fat meats; for they increase the relaxation of the fibres of the stomach, blunt the action of the saliva, the digestive qualities of the bile, the intestinal fluids, and occasion, by the slow manner in which they are digested, an unpleasant feeling at the pit of the stomach; they become rancid, and produce violent symptoms of irritation.

2dly. Those of a slimy or clammy nature operate in the same way as those before mentioned. These two classes comprise pastry, creams, &c.

3dly. Flatulent vegetables, such as greens, cauliflowers, &c. which frequently produce a most distressing and painful distention of the stomach, and embarrassment of the head. The development of air which

takes place in food is one of the greatest agents in favoring digestion, and we should not long survive, were we to feed on that deprived of air: but this air, so useful, so necessary when the organs are in their natural state, in which the disengagement of it is regulated by the action of the stomach and intestines, becomes hurtful when the organs are debilitated, for then the food is more corrupted than digested; it remains a length of time in the stomach, and the air being given out too rapidly, and in too great a quantity, the stomach is distended, the air becomes rarefied by heat, and causes frequent eructations, producing great pain: it compresses the viscera, alters their functions, and sometimes produces inflammations.

4thly. Those meats which are naturally hard or rendered so by being smoked or salted, which the digestive organs act but slowly upon, are likewise very pre-

judicial, and should be avoided, as they cause the same painful sensations as those already mentioned.

5thly. Those which are either too acid or which, by being acrimonious, produce insupportable irritations on the delicate nerves.

The species of food which seems to agree best with debilitated stomachs, are: 1. The tender flesh of young animals, with the exception of pork, duck, &c. 2. Fish of all sorts. 3. The different farinaceous grains, wheat, rye, oats, rice, and barley, and some of the leguminous grains: these may either be taken by themselves, or put into soup, forming a nourishing food, easy of digestion, and which may be used with advantage. Those herbs which are neither too relaxing nor too acid. 4. The different kinds of roots which are generally used, composed of a farinaceous substance mixed with saccha-

rine matter. Ripe fruits are extremely beneficial, as they contain a great quantity of sugar, which may be seen in a granular state on the surface of them, by their being kept after having been dried. Figs, a very saccharine fruit, were anciently the chief food of the athletæ or public wrestlers in Rome. The juice of the carrot, and, still more, of beet, yield a considerable quantity; the general calculation is about four or five pounds from one hundred of the root. From the experiments of Proust, it appears that a coarse sugar may be procured from grapes. Margraff (in the Mem. de l'Acad. de Berlin) says, that all the roots made use of for diet, and no doubt many others, contain sugar not inferior to that of the sugar cane, and which can be extracted without much difficulty. He says, that eight ounces of the juice of skirwort yields one ounce and a half of sugar.

Although certainly sugar affords great nourishment, still it must be acknowledged, that it frequently produces unpleasant symptoms in some persons;—this fact is noticed by Dr. Pemberton, who states that he has observed, that a gnawing pain in the stomach, a craving desire for food, and an increased flow of urine, constantly succeeded the use of sugar in the morning, and to have as constantly disappeared when it was omitted.—5. Bread, which is the chief subsistence of all nations, affords great nourishment, and has therefore been emphatically termed "the staff of life."—6. Eggs.—7. Milk.

The use of these aliments may be rendered more salutary, by some observations which it is of importance to make. With respect to meat, it may be eaten either roasted or boiled, which renders it more soluble in the stomach; and it is only in these ways, that the firmer parts,

as the tendinous, the ligamentous, and membranous, can be duly softened, and their gelatinous substances rendered subservient to nutrition: but if these processes are carried too far, the nutritious juices are extricated, and there remains nothing but dry fibres incapable of sustaining the strength of the constitution. All fried meats are less easy of digestion than those prepared in any other manner. — Eggs afford much nourishment, when they are new laid, and not much boiled, and they are a species of food which does not irritate the stomach, and are very easy of digestion; but, when the least putrescent, they are very hurtful: they are well adapted to those who are troubled with acidity of the stomach. If any one experiences any difficulty in digesting them entire, they will find that, by taking the white only, this inconvenience will be remedied, it being more

easy of digestion—at the same time it affords great sustenance to sickly persons.

Milk is one of the best and most digestible of all aliments, and is well adapted for sedentary men, if they have not acidity of the stomach, but it should not be taken with food which is capable of producing any alteration in it, or which is difficult of digestion. Indeed, it should never be taken but alone, with bread, rice, or when the food previously taken into the stomach is perfectly digested; for if it be mixed with the acids which exist in vegetables, it forms a coagulum, which renders it difficult to be acted upon by the stomach.

Chocolate must be considered more as an aliment than as a drink, for it consists of decoction of two substances—1st. a farinaceous substance, easy of digestion, and extremely nourishing; 2ndly, of a bitter penetrating oil, which, together, form a

were, the power of chusing whatever is grateful or beneficial to itself, and refusing what is injurious to the constitution. There are few persons who have not some particular propensity or aversion to certain kinds of food; cheese, honey, or other things of the like nature, which are agreeable to some, and act on others with the violence of a poison. Thus the stomach gives warning and denies admittance to what would be injurious, and often craves with avidity such things as prove salutary. Hence the eager thirst for cold water in the height of a burning fever, which, being permitted, has been known to terminate the disease, and save the patient's life, after the power of medicine has failed.—Some find that their stomach will digest meat better than vegetables, which occasionally produce a disagreeable sensation at the pit of the stomach; such persons will do well to abstain from them.

Others, again, will find vegetables more suitable; we must leave their own feelings on this head, to direct them in their choice, by following which they will seldom err. Plutarch was of opinion that sedentary men should live entirely on a vegetable diet, on the plea that animal food diminishes the natural acuteness of the mind. Although many other authors, and the example of some celebrated philosophers, might be adduced in favour of this hypothesis, still, I cannot but think there is great danger in confining men of this description wholly to a vegetable diet. Galen, Plimpius, and many others thought that fish was the most wholesome species of food for those who led an inactive life. He who means to be a rational epicure and to exalt the pleasure of eating beyond the reach of a sensualist, and to taste with the palate of nature, should eat with simplicity and moderation. Rich sauces

and high seasoned dishes, are without doubt, grateful to some; but this is an acquired and depraved appetite; for children and young people have always a dislike for them, till their taste is vitiated by custom and bad example. When the food and palate are in a natural state, the body is duly nourished; but when the food is deprived of its soft and balmy quality, and rendered caustic by high seasoning, it stimulates the languid appetite, turns round the wheels of life too rapidly, and wears out the body before its time. Those who abstain from much wine, spirituous liquors, and spicy aliments, acquire an exquisite taste; their spirits are more equal, their feelings more pleasurable, and they are in general much longer lived.

Thus the beneficent simplicity of nature is superseded by custom, which luxury, not propriety, has introduced; for, it

must be confessed, with regret, that in the affairs of human life, many are more guided by their passions and the examples of others, than by reason of their own understanding:

Foul luxury's the cause of all your pain:
To scour the obstructed glands abstain, abstain!
Fast and take rest, ye candidates for sleep;
Who from high food tormenting vigils keep:
Fast and be fat—Thou starv'ling in a gown;
Ye bloated fast—'twill surely bring you down.
* * * * * * * *
Fast and fear not—you'll need no drop nor pill;
Hunger may starve, excess is sure to kill.

Simplicity of diet is one of the most important and effectual means of preserving health, and should be strictly observed by those who have a debilitated stomach; they should never eat but of one or at furthest of two dishes at a meal. Many instances may be adduced in those persons who are naturally of weak stamina

having prolonged their existence by observing this maxim. If we reflect for a moment on the great variety of food which is frequently set upon tables during a repast, it cannot fail to appear ridiculous; and by paying attention to the consequences resulting from this practice, we shall have many opportunities afforded of convincing us of its fatal effects.

However simple the aliments made use of by sedentary men may be, they often prove hurtful, by the habit they have of eating, as it were, mechanically, without masticating, whereby they are deprived of one of the most essential means of promoting the necessary digestion. Nothing renders the action of the stomach more efficacious than mastication: for whilst the food is undergoing this operation, the flow of saliva is greatly increased, and the food being lacerated and bruised, is more easily penetrated by the fluids

secreted by the stomach, and is soon altered to that state proper for affording nourishment to the body, without inducing fatigue of the different organs engaged in performing the necessary change. This first step towards the formation of chyle being perfectly performed by every other function is exercised with its natural facility. Mastication has also other advantages, for we really eat less without being less nourished, and it contributes greatly towards the preservation of the teeth. Its importance therefore cannot be too strongly impressed on the mind---for men of sedentary habits being generally troubled with indigestion, it becomes highly necessary they should attend to the most trifling circumstance which has a tendency to impede the performance of a function so essential to health.

As digestion is slowly performed, it is improper for men not taking exercise to

eat often, for there is a wide difference between the state of the stomach half full of food partly digested and which requires the whole force of that organ to complete it, and that in which the stomach completely empty has received its natural tone, and is supplied with the requisite quantity of its juices, waiting the receipt of new food. Every thing which is taken into the stomach in the first state, is a source of irritation, and prevents the digestion already commenced, and it does not therefore undergo the change necessary for its conversion into blood; these persons should not eat oftener than three times a day, two light meals and one rather stronger. Many will derive much benefit from following the line of life here pointed out.

The happy effects of early rising has been so often noticed, and so effectually treated upon by many of our most eminent

authors, that it would be needless for me to attempt impressing it more forcibly on the mind. I shall therefore content myself by observing that after having risen, a glass of cold water should be drunk, and one or two hours may be devoted to study; after resting half an hour, breakfast may be taken; shortly after which, the mind will be in a fit state for exertion, which may be continued five hours; then recourse should be had to exercise for at least one hour; the fatigue of which having subsided, the stomach will stand in need of nourishment. After dinner the mind should not be employed in thought for some time, till digestion is completed, which will probably be in three hours; but the time should be spent in pleasant society, or a gentle walk, which will not fatigue the body, is also unobjectionable.

A few hours in the evening may be dedicated to study, after which a *very light*

supper should be taken; this is of great consequence to those who have much mental fatigue:

1st. Because the blood is determined to the head during sleep, which is likewise favoured by the position of the body. There are many phenomena which indicate the presence of this plenitude, one in particular which may be frequently noticed; I mean the grinding of the teeth, which so often occurs in children, and not unfrequently among grown up persons.

2dly. The action of the nerves being diminished during sleep, the digestion dependent on that action must be proportionately imperfect.

3dly. Anxiety of mind will disturb the sleep, and the stomach being full, causes greater irritation of the nerves, and frequently prevents it altogether.

Although a heavy supper is prejudicial to the constitution, yet it must be observed

that a great error is committed by not taking any; for when the stomach is very sensible and the nerves delicate, and we remain for a length of time without taking nourishment, the juices subservient to digestion become acrid, and not being enveloped by the aliments, it inflames the stomach, and by that means produces precisely the same effects as those already noticed.

Those who indulge in the pleasures of the table, will, no doubt, be tempted to regard these rules as rigid and superfluous; but many instances might be adduced which would clearly prove their efficacy as the preventives of disease. The most striking example of the kind on record, is that of Louis Cornaro, a Venetian Nobleman, of one of the most ancient families of that republic, who when only twenty-five years old was attacked with diseases of the stomach, pain in the side, gout, and fever; and not-

withstanding a variety of remedies were tried to recover his health, he continued till he was forty years of age in a very debilitated state, when he resolved to give up the use of medicine, and follow a most rigid course of life, allowing himself only twelve ounces of solid food and fourteen ounces of liquid a day; which is about a fourth part of the aliment usually taken by persons in the country where he lived; the effects of which regimen he explains in a useful work entitled 'Discorzi della vita sobria,' were such that his infirmities left him by degrees, and were succeeded by good health and a robust constitution, accompanied by a feeling of pleasure and contentment, which he had never before experienced. At the age of seventy-five he wrote a work in which he gives one of the most pleasing pictures of human life which can be pourtrayed; "I find myself," says he, "as lively and healthy as persons generally are

when twenty-five years old; I commonly write seven or eight hours a day, the rest of my time is spent in walking, in cheerful society, or sometimes I take a part in a concert. I have a relish for every thing I eat; my imagination is quick; my memory retentive; my judgment clear; and what is most surprising at my age, I have a strong harmonious voice." It was not till he was one hundred years old that he died.

The immortal Newton, who lived to an advanced age, when he was employed in meditation seldom took any thing but bread and water, rarely having a little wine; and during the whole of his life it was his general manner of subsisting, with the exception of now and then a small quantity of animal food. As a proof that little nourishment is sufficient for sustaining strength of body, I shall relate an experiment made by a Student of Physic at

Edinburgh, who confined himself for a length of time to a pint of milk and half a pound of white bread daily; he passed through the usual labours of study and exercise, without feeling any decay of health or strength, and without any sensible loss of bulk. It is, indeed, truly surprising how long life may be sustained without taking any food. Fontanus, a respectable writer in the estimation of Morgagni, relates the history of a woman who lived fifty days obstinately refusing to take nourishment but twice during that period. But he adds, she took water by way of drink, though in small quantities. Redi, who made many cruel and unjustifiable experiments to ascertain the effects of fasting upon fowls, observed that many lived nine days without taking any food, and if they were allowed water to drink they were able to sustain life for more than twenty days. By this then it

would appear that the strength does not depend so much on the quantity of food, as it does on the purity of the blood. Animals who die of hunger, seem rather to perish by the corruption of the blood, or morbid change of its quality; hence, a circumstance, though strange, becomes perfectly consistent and intelligent; viz. why animals will survive so long, even twenty days or more, by the use of water only; for this refreshes and purifies the blood.

Water is the beverage which nature has given to all nations; she has made it agreeable to all palates, and has rendered it capable of acting on all aliments. The ancients looked upon it as the great Panacea; and it is of essential benefit where there is acidity of the stomach, fever, or depraved state of the bile. How superior is this liquor gushing from the bosom of nature, to all the artificial

preferred, as most free from all heterogeneous bodies. Spring water is only rain water, which having gradually filtered through the earth collects at the bottom of the declivities, and then makes its way to the surface, and is therefore equally pure with rain water, provided it does not meet with any soluble body in its passage through the soil. But we shall generally find even in the purest spring water a little carbonate of lime and common salt, besides the usual portion of air and carbonic acid gas. River water may be considered as merely a collection of rain and spring water; and is therefore at least equally pure with these. In fact, when the current is rapid and the bed of the river silicious sand, it is generally purer than spring water; for it deposits in its way every thing which was merely mechanically suspended. Well water is the same as spring water, being derived from the same source; but it is more

likely to be impregnated with foreign bodies, in consequence of its stagnation, and is therefore rendered more unfit than the others for the purposes above mentioned; for these earthy salts have the properties of decomposing common soap; their acids unite with the alkali contained in the soap, while the earthly basis forms with the oil a soap not soluble in water, which envelopes the soap and gives it a greasy feel. When water is pure it facilitates digestion, increases all the secretions, prevents the different organs from being overloaded, renders the sleep more tranquil, the head clearer, and the spirits more equal.

Wine on the contrary acts as a stimulant, irritating the muscular fibres, and increasing the circulation of the blood, which if frequently repeated greatly tends to shorten the existence of man. It augments the acidity of the stomach, and it has another effect

probably of more consequence than the rest, which is that of increasing the determination of the blood to the head, and frequently produces apoplexy.

I am well aware it is very often taken under the impression that it assists digestion; but this is a fallacious idea: for it most commonly retards it even in persons of strong habits, and it is very prejudicial in most of the nervous diseases, which are the inevitable consequence of excessive study or great mental anxiety. The frequent use of warm liquids is not less hurtful than wine, and it is at present more frequently had recourse to; the sophism which has induced persons of a debilitated constitution to make so great a use of them is perhaps not difficult to explain. It is true that in such persons the circulation of the blood is carried on feebly and slowly; the humours are vitiated, and the secretions obstructed; but these depend more on the

weakness of the vessels, than on the density and viscidity of their contents, which, in point of fact, are not of their natural consistence.

To give an idea of the blood, to those who are not acquainted with its properties, I shall observe that on a cursory examination it will appear to be an homogeneous mass, but this is by no means the case; for, by numerous experiments, it has been ascertained to consist of serum, coagulable lymph, red particles, superfluous water, and extraneous substances; the serum, coagulable lymph, and superfluous water are diffused through one another, but the red particles are found to be merely mechanically mixed with them. It does not always contain the same proportion of the principles above-mentioned; for an increased celerity, whether by laborious and strong exercise, a full age, fever, or otherwise, augments the red particles, the con-

gealing force, and the cohesion of these particles. On the other hand, in younger and less active animals, and if more watery diet be made use of, the red particles are proportionably lessened, and the fluid parts increased. A person is said to be of a sanguine habit when there is an abundance of the red particles, and such persons are predisposed to inflammation, hæmorrhage, and apoplexy. A phlegmatic constitution, on the contrary, is produced by there being a redundancy of the watery part: hence occurs dropsy, and all other diseases dependant on this state of the blood. If blood be drawn from two men, the one of a robust constitution, in the habit of following a laborious occupation, and the other a person whose life is spent in his study or counting-house, and not taking sufficient exercise, or, indeed, any one who has suffered from severe illness, we shall in the first find the blood thick

and heavy, and in some respects similar to what will be observed in any one who labours under an inflammatory disorder; in the other we shall find it thin and watery. That part which in the first forms a firm substance will, in the second, be only gelatinous. In the man of robust habit it will be obvious that warm relaxing fluids cannot be detrimental to health; nay, they are evidently as necessary as though the superabundance was produced by disease; but the object of the latter should be directed towards making the blood of its natural consistence, and he should, for that reason, avoid taking much fluid, and more especially warm ones, which increase the disposition to dropsy. It is plain that health cannot subsist without a dense and red blood; if its quantity be too much diminished, a stagnation of the juices takes place; the surface of the body becomes pale, cold, and contracted. Nor can health or life subsist without a suffi-

ciency of the thinner juices intermixed with the red particles; for if they were deprived of the watery part, they would congeal and obstruct the smallest passages of the vessels. The stomach suffers very materially from the effects produced by warm fluids; for the great quantity which is frequently taken distends the muscular fibres, and it is well known that when they are distended for any length of time, or in a violent degree, they lose the power of contracting. It is not by the quantity only, but also by the quality that they prove injurious to the stomach, which, by being relaxed, is rendered unfit for the performance of its functions; the food resting a long time in the stomach causes a disagreeable sense of weight, for the removal of which recourse is often had to the drinking a great quantity of fluid (not unfrequently warm water), which carries with it the food but *half* digested; and though it may possibly

for the time relieve the oppressive load, it in reality augments the cause of the disorder.

Another bad effect produced by the introduction of warm water into the stomach is its diluting the different secretions subservient to digestion, which no other fluid has the power of rectifying.

I have heard it asserted that the quantity of fluid taken into the stomach, and more especially of water, cannot prove injurious; but I should rather doubt if such persons were well acquainted with the laws of the animal economy. Loss of tone of the stomach, want of power in the juices to act on the aliment, and debility caused by the food being carried off without being digested, are the certain effects produced by this abuse, and which are more or less increased by the quantity which is taken: besides the mucus which lines the interior of the stomach and intestines, and preserves the nerves which expand on the surface from receiving too

strong an impression from the food, or whatever they may give passage to, is washed off, and the nerves become exposed, and are irritated by any thing received into the stomach, causing excruciating pain; and though this may not occur till the food has remained half an hour or more, yet the pain is sometimes so intolerable that it will be returned very little changed by the operation of digestion, and generally accompanied by a sympathetic head-ache. The intestines are likewise irritated: hence arise violent cholic pains, and oftentimes ulceration takes place; at length every nerve in the body participates and occasions insupportable irritability. The effects of hot water are sometimes greatly aggravated by the different extraneous substances it contains.

With respect to the good or bad effects produced upon the constitution by the use of tea, there are, no doubt, many inconsistencies advanced by different authors

who have written on the subject. It must, however, be acknowledged that it will be found hurtful to persons of lax habits or when taken to excess. Tea drank too hot will enervate, and if very strong it may prove pernicious by affecting the head and stomach. Upon the whole it must be esteemed either beneficial or hurtful according to the temperament of the person using it; to determine which every one should consult his own feelings, which will best inform him whether he does right or the contrary. It should not, however, be taken either too strong or too warm, and should always be mixed with a large portion of milk.

Coffee must be looked upon as a stimulant: it is composed of an aromatic oil combined with a farinaceous substance of easy digestion, and affording nourishment: nor is it less entitled to the appellation of a stomachic; for it is one of the most grateful, and certainly possesses great

powers; but the daily use of it should be abandoned as being really detrimental to health; for the frequent irritation which it produces in the stomach must in the end destroy its powers, and the whole nervous system frequently participates. Percival says, "In delicate habits it often occasions watchfulness, tremors, and many other complaints which are denominated nervous. It has even been suspected to produce palsy, and, from my own observation, I should apprehend not entirely without foundation." Slare affirms that he became paralytic by the too liberal use of coffee, and that his disorder was removed by abstinence from that liquor. When taken occasionally, and in moderation, it invigorates the whole body, stimulates the stomach, increases the secretions, and enlivens the ideas. If a cup of strong coffee be drank within an hour after dinner, it is very efficacious in relieving that drowsiness and head-ache arising from indiges-

tion, attendant on a debilitated state of the stomach, produced by sedentary habits or accidental inebriation. Persons affected with sick head-ache are also much benefited by the use of it in some instances, though its effects are by no means certain. It is found by experience to counteract the effects of opium, and is therefore taken in large quantities by the Turks and Arabians. Milk diminishes the irritation caused by the too liberal use of it; but it cannot entirely prevent its bad effects. Sedentary men will do well to reserve it as one of their favourite remedies, and not make it a part of their daily food.

The extremes of cold, but more especially of heat (for its effects cannot be so readily guarded against), are hurtful.—Moderate cold produces first debilitating, and eventually bracing effects on the human frame; but when the weather is intensely cold, the external air, from its increased density, compresses that within,

and frequently occasions stupor, apoplexy, and death. The coldness of the feet which many persons who do not take sufficient exercise continually complain of, is very injurious to those of weak temperament, occasioning violent cholic pains, hindering sleep, and suppressing the perspiration. Many persons have been relieved from this after having taken different narcotic medicines without the least effect, upon using exercise before going to bed; in some cases it would be advisable for them to apply a warm stimulating plaister to the soles of the feet.

As an undue determination of blood to the head is of so frequent occurrence in the persons to whom these pages are addressed, nothing should be neglected which can reasonably afford the prospect of diminishing or guarding against this circumstance. Many persons after having been many hours engaged, on finding the head become hot, have enveloped it with cloths

dipped in cold water, which practice cannot be too much reprobated as replete with danger. As a preventive of this disagreeable sensation I would recommend them to wash the head every morning in cold water; but if this does not produce the effect, on the first intimation of increased heat in the part, a glass of cold water may be drank, and a cessation for some hours of the pursuit in which they are engaged is the only means that can be had recourse to with safety.

The use of tobacco is injurious in various ways: the first time that any person smokes, precisely the same effects are produced as though they had taken wine, spirituous liquors, or opium; and if in the course of time they do not experience its intoxicating effects it is because they are habituated to it. This pernicious custom was originally derived from savage nations, who had recourse to it to pass away that time, which civilized persons know how to employ so

much better. Although it does not prove hurtful to every one, yet it most certainly does to a great many, and it is equally certain it is not necessary for any. In smoking, the fumes induce a kind of insensibility not easily described, which equally infatuates the ignorant savage and the intelligent philosopher; but by the large secretion of saliva which it occasions, it causes many diseases, both of the head and stomach. The injury sustained by the use of tobacco is always proportionate to the loss of saliva which it occasions, and to the narcotic effects it produces on the sensorium.

The salivary glands being accustomed to this irritation, cease to act when they are not stimulated; by the loss of saliva the force of the stomach and intestines is diminished, the appetite fails, and digestion is suspended. By its narcotic effects it greatly augments the diseases of the stomach, it causes head-ache, giddiness,

and apoplexy, and many instances may be adduced of men having died of this latter disease induced by this cause. Two brothers, wishing to try which could smoke the greatest quantity of tobacco, fell sacrifices to their imprudence, and both died of this disease, one while smoking his seventeenth and the other his eighteenth pipe. In some diseases and under certain circumstances, smoking produces beneficial effects; for a part of the smoke taken in at the mouth must necessarily enter the lungs, and its narcotic power being applied there frequently affords relief in some cases of asthma, and by its stmulating quality it promotes expectoration, and thereby proves useful in colds, &c. According to Hoffman, it is sometimes of use in diminishing cholic pains. Tobacco has been stated as efficacious in guarding against contagion; but I should question if it possesses any power superior to other narcotics; it may pos-

sibly, by diminishing sensibility, and rendering the mind less liable to fear in some measure be of service.

To adopt what is pleasurable to our feelings or subservient to use, cannot be thought strange; but that tobacco, which is disagreeable to the taste and hurtful to the constitution, should by habit become desirable, is a most extraordinary circumstance, and affords a striking instance of the folly and infatuation of the human mind opposed to sense and nature. When powdered and applied to the nose the moisture is dried up, and those fine and delicate nerves, the organs of smelling, are rendered callous and insensible.

To this self evident bad effect may be added its narcotic and stupifying power, by which not only the brain and nerves are injured, but the eyes which depend on their influence are also affected, and from the force with which snuff is usually drawn up the nose, its passage will be obstructed

and the voice lose its clearness and distinct articulation. The only advantage of taking snuff is that of sneezing, which in the sluggish and phlegmatic habit will give universal concussion to the body, and promote a more free circulation of the blood; but of this benefit professed snuff-takers are deprived, from being too familiar with its use; when they take it to excess, it produces the same giddiness as when first employed; and in some cases the effects are more violent, as appears not only by its action on the brain, but as may be observed in other parts of the system, particularly in the stomach, occasioning loss of appetite, and other symptoms of a weakened state of that organ.

Although persons taking a considerable quantity of snuff appear not to suffer any inconvenience, still it may and frequently does operate in an insensible manner, producing loss of memory, fatuity, and a state of torpor in all the nervous system. Dr.

Cullen says he has known excess in snuff-taking to produce indigestion and pain in the stomach, which upon accidental interruption of the practice for some days did not occur; but again upon a return to snuff recurred as at first. He likewise adds, he knew a lady who had been for more than twenty years in the habit of taking snuff, and that at every time of the day; but she at length observed, that snuffing a good deal before dinner took away her appetite; and she at last found that a single pinch taken any time before dinner had the same effect; when however she abstained entirely from snuff before dinner, her appetite continued as usual, and after dinner for the rest of the day she took it pretty freely without any inconvenience. One invariable consequence of snuff-taking is its exciting a considerable discharge of mucus from the nose; I have seen several instances of head-ache and inflammation of the eyes relieved by

this means; but it should be particularly observed, that when the discharge of mucus is considerable, the ceasing or suppression of it by abstaining from snuff is apt to occasion the very disorders it has before relieved.

Such are the principal observations which can be made on the causes producing disease, and upon the best means of guarding against them; but when they have arrived to that state requiring medical aid, they must be treated according to symptoms. I shall however mention such means in conjunction with medicine as will afford the most rational prospect of re-establishing the healthy and natural functions of the body.

The most important advice which can be given, by inattention to which every other means will prove unavailing, is absolute relaxtion from those employments causing mental anxiety; however severe this may appear, it is still indis-

pensably necessary. As a proof of the benefit to be derived from it, I shall mention a curious anecdote of a gentleman who for a long time consulted Dr. Sydenham; but was little relieved: the Dr. told him he really could do no more for him; but there was a Dr. Robinson, of Inverness, who was wonderfully clever in such complaints as his; that he would give him a letter of introduction to him, and he was confident he would come back cured. The patient was a gentleman of fortune, therefore he was soon able to begin his journey. When he arrived at Inverness he found there was no physician of that name, nor ever had been in the memory of any person there. The gentleman returned, vowing vengeance to the peace of Dr. Sydenham. When he arrived he was in a very ill humour, and told him he thought he had used him unkindly to send him a journey of so many hundred miles for nothing. "Well," says he,

"are you better in health?" "Yes I am well now, but no thanks to you." "No," says Dr. S. "but you may thank Dr. Robinson for curing you. I wanted to send you a journey with an object in view; I knew it would do you good; in going you had Dr. Robinson in contemplation; and in returning you were equally busy in thinking of scolding me." Business of every kind should be totally forgotten, and the time should be passed in walking or riding about the country in agreeable company; for,

There is a charm, a power, that sways the breast,
Bids ev'ry passion revel or be still,
Inspires with rage, or all your cares dissolves,
Can sooth distraction, and almost despair—
That power is music.

When the constitution is much reduced and debilitated, a milk diet is frequently of much service, provided it does not cause constipation, in which case salep

will be found very beneficial; it contains the greatest quantity of vegetable nourishment under the smallest bulk, and is possessed of great restorative mucilaginous and demulcient qualities; it is therefore well adapted for invalids. At other times light diet and a little wine may be taken if there is neither pain in the chest nor fever.

The cold bath is of essential service to those persons whose bodily strength has been exhausted by mental fatigue, for it strengthens the stomach, and indeed every function. But it should not be had recourse to when the body is much debilitated, as it would then be likely to produce some very hurtful consequences. It is by the suddenness of the shock that the cold bath is beneficial in strengthening the system, the humours leaving the external parts of the body are determined to the internal; this sudden impetus stimulates these parts, and the blood is returned; it

is on this re-action that its efficacy depends, for should the internal parts be deficient in the power to send the blood back in its natural course, the chilliness and head-ache which succeeds its use, would clearly indicate the impropriety of its use.

Let this, therefore, be laid down as a general rule.—When immersion is succeeded by a genial glow over the whole surface of the body, and the patient feels cheerful and has a keen appetite, we may conclude that the cold bath is of service: if, on the contrary, he shivers on coming out of the water, continues chilly, and becomes drowsy, we may be assured that it does no good, and had better be omitted. Under such circumstances, the tepid bath, about 96 or 98 degrees of heat, will be found more efficacious; as it stimluates and communicates heat to the system.—The use of the flesh brush should not be neglected; it should be used every morning and night,

as it increases the circulation of the blood, prevents the bowels from being loaded with fæces, and facilitates every secretion. The ancients knowing the advantages which were derived from this practice, employed it not only as a remedy in disease, but as one of the most powerful means of preserving health.

Mineral Waters are deserving of attention; the Author of Nature has given them many powerful and salutary properties, and there are few countries in which they do not exist. Those most in vogue are Bath, Buxton, Seltzer, Tonbridge, Pyrmont, Spa, and Cheltenham; the most usual effects of which are relieving flatulence and sickness, and if persevered in will increase the appetite, render the secretions regular, and improve the general health and spirits. However useful they may be of themselves, their efficacy is much increased by their being taken at the spring, for the mind being amused by the

company and a variety of entertainments, they are sure to produce greater benefit. The advantages of air, exercise, the regular mode of living generally adopted at those places, and the agreeable prospects which present themselves, admirably coincide with the general curative effect of the spring itself.—They should not be taken without first consulting a medical attendant, for though they are extremely proper in some cases, there are others in which they are diametrically the reverse.

The costive habit of body of which sedentary persons so generally complain is often greatly increased by their taking irritating purgative medicines; these by being frequently repeated render the bowels tender and cause colic pains, especially after taking cold, errors in diet, or other accidental causes, which in their sound state would not have produced such effects; besides by their long continuance of them, they deprive the body of nourishment,

the blood is greatly impoverished, and dropsy or consumption is not unfrequently the consequence. When the bowels are weak and inactive, early rising, exercise, the flesh brush, and the cold bath, with the occasional use of some mild laxative medicine, or even roasted apples, prunes, &c. will be found beneficial. An habitual attention to the removal of costiveness by instituting a regular custom of periodically soliciting an evacuation by voluntary and persevering efforts, will powerfully aid the effects of the other means here pointed out.

The morning is the most proper period for the attempt, and the trial should be prosecuted for at least a quarter of an hour, if the evacuation be not earlier excited. Perhaps a week may be unavailingly employed in this endeavour; but the proposed effect will generally be attained within a month: one month has, indeed, *in a number of instances*, fully established

an habitual call to intestinal evacuation, under circumstances that previously required the almost daily use of aperient medicine.—The health is recovered slowly and the return of strength is tedious; the mind is so materially affected by disease that many will for ever after remain in a state of imbecility. Convalescents should not imprudently return too soon to their employments; for they will by such thoughtlessness bring upon themselves many new diseases in addition to their other sufferings. From a want of attention during the progress of recovery they are liable to repeated attacks of disease, the body not having regained sufficient strength to resist the consequences of their indiscretion.

Having now endeavoured to designate the causes, symptoms, and preventives of the diseases to which literary and sedentary men are subject, and the influence of the passions in producing many baneful effects

on the system, I shall only observe in addition, that those who sacrifice their health at the shrine of fortune, whose minds are solely engaged in the acquirements of wealth will be the greatest martyrs to these disorders.

Far be it from my wishes, however, to create a disrelish for study, or to promote inattention to the necessary avocations of life—it is merely the excess I would guard against. An enlightened and cultivated mind is a great and honourable distinction; but if health is sacrificed to its attainment, we destroy the very object we are most anxious to obtain.

FINIS.

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